

**Regional Water Quality Control Board
Central Valley Region
Board Meeting – 2-3 February 2012**

Response to Written Comments for Caruthers Raisin Packing Company, Inc. Raisin Processing Plant and Mr. Jon Robinson Tentative Waste Discharge Requirements

At a public hearing scheduled for 2-3 February 2012, the Regional Water Quality Control Board, Central Valley Region, (Central Valley Water Board) will consider adoption of Waste Discharge Requirements (WDRs) for Caruthers Raisin Packing Company, Inc., Raisin Processing Plant and Mr. Jon Robinson. This document contains responses to written comments received from interested parties regarding the Tentative WDRs (TWDRs) initially circulated on 6 December 2010. Written comments from interested parties were required by public notice to be received by the Central Valley Water Board by 6 January 2011 to receive full consideration. Comments were received by BSK Associates Engineers & Laboratories on behalf of Caruthers Raisin Packing Company, Inc. (Caruthers Raisin) and Ms. Jo Anne Kipps.

Written comments from the above interested parties are generally cut and pasted into the appropriate sections below, followed by the responses of the Central Valley Water Board staff.

CARUTHERS RAISIN COMMENTS

CARUTHERS RAISIN – COMMENT No. 1: Caruthers Raisin requests that the allowed monthly and annual wastewater volume limitations be increased to 0.16 mgd and 30 million gallons, respectively. A water balance indicates that the fields are hydraulically capable of accepting the proposed flows without flooding. While it is understood that BOD loading rates are also a consideration of the flow limitation, the volume limitations themselves may limit future growth of the facility even if decreased BOD concentrations are attained.

RESPONSE: The conditions specified in the Tentative Order, including the monthly average and annual flow limits of 0.13 mgd and 25 million gallons, were set to limit the discharge consistent with current operations at the Plant and to restrict pollutant loading to levels necessary to protect groundwater. To increase flows, Caruthers Raisin would need to expand its application area and/or provide additional storage and treatment of its wastewater. This would represent a material change in the discharge and require that Caruthers Raisin submit a new Report of Waste Discharge (RWD). Once the RWD is complete the Central Valley Water Board would then amend or update the WDRs.

CARUTHERS RAISIN – COMMENT No. 2: The California League of Food Processors' *Manual of Good Practice for Land Application of Food Processing Rinse Water* (Manual) states that sprinkler application allows for equal distribution of reuse water on the land application area "Reuse Areas" and is more conducive to re-oxygenation of the soil than flood irrigation.

COMMENT No. 2.1: Table 7-5 of the Manual allows for up to 150 lbs/acre/day BOD loading rate for a Risk Category 2 using sprinkler application on well-drained soils. Site-specific data was also used to determine the ultimate BOD loading rate using Category 3 equations of the Manual, which was calculated at 170 lbs/acre/day. The equations indicate that an ultimate BOD loading rate of approximately 150 lbs/acre/day would still

be equal to or below the available oxygen supply in the subsurface. Therefore, it is requested that the peak season BOD loading rate be increased to 150 lbs/acre/day.

COMMENT No. 2.2: The de-minimis loading rate for Risk Category 1 in Table 7-5 of the Manual is 50 lbs/acre/day with a 50% increase for sprinkler application on well drained soils (75 lbs/acre/day). The Tentative Order states that the off-season loading rate would be limited to 50 lbs/acre/day. The reuse water is applied through sprinkler application regardless of peak season or off season. Therefore, it is requested that the off-season loading rate be increased to 75 lbs/acre/day.

RESPONSE: There is no specific number or formula to determine what specific BOD loading rate for a particular site will be protective of groundwater. Technical references recommend BOD loading rates anywhere from 40 lbs/acre/day to 600 lbs/acre/day. However, most studies appear to have focused primarily on the assimilative capacity of the soil to break down organic constituents and prevent odor and nuisance conditions. It appears, from the available studies, that the potential dissolution and transport of carbonates and metals such as iron and manganese into the lower soil profile below the depth of the rooting zone and its potential to reach and degrade groundwater is very site-specific.

Since historical organic loading rates at the site have caused groundwater degradation/pollution with iron and manganese and have caused increases in bicarbonate alkalinity and electrical conductivity down-gradient of the 5-acre land application area, it is important to restrict BOD loadings to the lowest possible levels to prevent further degradation of groundwater. The BOD loading limits presented in the Tentative Order were intended to reflect Caruthers Raisin's best efforts to reduce organic loading to the Reuse Area. While some studies show that sprinkler application on sandy soils allows for a more even distribution of wastes and better re-aeration of the soil, which would in turn result in better breakdown of the applied organic materials and less potential for the formation of dissolution byproducts, there is generally insufficient information in the Manual of Good Practices to support a blanket 50% increase in the organic loading. However, given recent groundwater data that shows an improvement in groundwater quality with respect to iron, manganese, and arsenic, the Order has been modified to set a cycle average BOD loading limit of 150 lbs/acre/day. The Order has also been revised to include a Provision requiring Caruthers Raisin to complete a two year site specific loading study and groundwater evaluation. At the end of the study Caruthers Raisin must demonstrate that the BOD loading rate of 150 lbs/acre/day will continue to be protective of groundwater and that legacy issues from historical operations will remediate over time. At the end of the two-year study, the Order may be re-opened to establish more restrictive requirements and lower BOD loading limits, if necessary.

COMMENT No. 2.3: Although peak raisin packing season is typically July through October, this past year the facility began processing as early as April to meet USDA export demands. In a typical year the USSDA export program runs from June through November. In addition, during rainy years additional processing is required to remove excess sand from the raisins. The excess sand removal process may run from September through January.

The crop cycle consists of Sudan grasses planted in March/April and harvested in October/November and a winter wheat/oat plant that is cultivated between October/November through March/April. Sprinkler irrigation is used regardless of the crop or period. Neither crop usage nor reuse water application methods change between March/April and October/ November. Rainfall between June and November is typically negligible. Therefore, it is requested that the peak season loading rate limitation be applied from June through November to accommodate anticipated peak packing periods.

RESPONSE: Due to the variability between peak and non-peak seasons, which appear to change from year to year, the Order has been modified to include a cycle average BOD loading limit of 150 lbs/acre/day rather than a tiered BOD limit. Caruthers Raisin will also need to comply with the annual flow limits specified in the Order.

CARUTHERS RAISIN – COMMENT No. 3: The Tentative Order proposes groundwater monitoring on a quarterly basis. It is requested that the monitoring frequency be reduced to semi-annual sampling after two years of quarterly sampling or until eight (8) groundwater sampling events are conducted, unless groundwater quality indicates there is a continued need for quarterly sampling.

RESPONSE: No change has been made at this time. There is insufficient data to support a reduction in the groundwater sampling frequency at this time. As indicated in the Monitoring and Reporting Program (MRP), Caruthers Raisin may request that the MRP be revised to reduce monitoring frequency if sufficient technical justification is submitted to support it. Once the new monitoring wells required as a part of the Order have been installed, and sufficient data has been collected to support a decrease in monitoring frequency, Caruthers Raisin may request that groundwater monitoring be reduced to semi-annually.

CARUTHERS RAISIN – COMMENT No. 4: As noted in several sections within the Tentative WDRs, groundwater concentrations of nitrate up-gradient of the Caruthers Raisin Facility typically contains nitrate in excess of the Maximum Contaminant Level (MCL) for nitrate of 10 mg/L. The tentative Order states “Release of waste constituents...shall not cause or contribute to groundwater: a. Containing concentrations in excess of [10mg/L] or natural background quality, whichever is greater.” While the Order takes the background

concentrations into consideration, the Findings do not. The Findings should be updated to consider background conditions.

RESPONSE: The Groundwater limitation in F.1.a for nitrates is set such that the discharge shall not contribute to nitrate concentrations in groundwater down-gradient of the site exceeding [10 mg/L] or natural background concentrations, whichever is greater. Finding 44.b is not intended as a groundwater limitation; rather it states that the discharge under the conditions authorized by the Order shall not contribute to nitrates in groundwater exceeding 10 mg/L.

JO ANNE KIPPS COMMENTS

JO ANNE KIPPS (JK) – COMMENT No. 1: Finding 2 indicates that Caruthers Raisin Packing Company, Inc. (“Caruthers Raisin” or “Discharger”) has discharged raisin processing wastewater to a 5-acre parcel adjacent to its Plant property since 1985 and states, “This discharge was not regulated by waste discharge requirements.” **Recommendation 1:** This finding should be revised to explicitly state that the Discharger initiated the discharge without filing a report of waste discharge as required by California Water Code (CWC) ' 13260 and, as such, conducted the discharge for almost two decades in violation of CWC ' 13264. [A violation of ' 13264 carries an administrative civil liability of up to \$1,000 per day of violation per CWC ' 13265.] It is appropriate for the Central Valley Water Board to find that this Discharger had conducted its discharge in violation of CWC ' 13264, particularly because elsewhere the Tentative Order finds that the unauthorized discharge has degraded groundwater passing under the 5 acre parcel from salt and metal constituents, and caused it to contain iron and manganese in concentrations exceeding applicable water quality objectives.

RESPONSE: Clarifying information has been added to the tentative WDRs Findings and Information Sheet. The assertion that Caruthers initiated discharge without filing a RWD is inaccurate. The facility was constructed in 1985, and in 1985 Caruthers Raisin submitted a RWD and the Central Valley Water Board waived waste discharge requirements for the proposed discharge due to its small size and because Fresno County had a program to regulate food processing facility discharges. The Central Valley Water Board file is then mute on this issue until 3 December 1992, when Board staff inspected the facility in response to odor complaints. The resulting staff inspection report states that the facility “discharges without waste discharge requirements.” However, the 22 March 1993 transmittal letter does not make such an accusation nor does it revoke the 1985 waiver of waste discharge requirements that Caruthers Raisin was presumably still operating under. The letter does require a RWD, which Caruthers Raisin submitted in September of 1993. Board staff did not comment formally on the RWD. Due to legislative changes, Resolution 82-036 expired on 1 January 2003. There is nothing in the file notifying Caruthers Raisin of

this or its implications. One could argue that the discharge was waived under Resolution 82-036 until the waiver resolution expired. Following an August 2003 odor complaint inspection, Board staff sent a letter requiring Caruthers Raisin to submit a revised RWD. Board staff reiterated the request in August 2004. Caruthers Raisin's consultant requested an extension, and Caruthers Raisin submitted a RWD on 22 November 2004. Board staff notified Caruthers Raisin that the RWD was deficient on 22 December 2004. Caruthers Raisin has submitted addenda to the RWD on 14 October, 9 December, and 22 December 2005; and 31 March 2009. While these submittals have not historically addressed all Board staff concerns, Caruthers Raisin has made efforts to improve the quality of its discharge, prevent odor and nuisance conditions, and increased its disposal area. The Order has been modified to better reflect this history.

JO ANNE KIPPS (JK) – COMMENT No. 2: Findings 6 and 7 characterize the Plants current production and wastewater flow patterns, and indicate that the Plant's average annual wastewater discharge flow is about 24 million gallons. In 2006, the discharge's biochemical oxygen demand (BOD) concentration averaged 7,300 mg/L. Assuming that the Plants annual wastewater flow (24 million gallons) and discharge BOD are similar to that characterized in 2006 during the decades the Discharger conducted the unauthorized discharge, the discharge's annual BOD loading to the 5-acre disposal area was about 1,500,000 lbs or 800 lbs/acre/day as a daily average.

It is instructive to express this loading in terms of population equivalents. Assuming a typical per capita domestic wastewater flow of 100 gallons per day (gpd) and an average domestic wastewater BOD content of 200 mg/L, the population equivalent of the unauthorized discharge to the 5 acre disposal area was equivalent to the wastewater flow of about 650 people, and BOD loading of about 25,000 people. Given this concentrated loading to the 5-acre disposal area, it is not surprising that the discharge degraded underlying groundwater.

Recommendation 2: The Tentative Order should identify the loadings of waste constituents (BOD, nitrogen, salts) to the 5-acre disposal area prior to the Dischargers initiation of treatment in 2006. This information will support the Central Valley Water Board's inclusion in the Tentative Order (recommended below) of a provision prohibiting discharge to the original 5-acre disposal area. **Recommendation 3:** Finding 7 should identify where in the wastewater treatment process flow the Discharger installed a flow meter. Does the meter monitor flow entering or exiting the three 9,000-gallon aerated tanks? This is relevant because the Tentative Orders Monitoring and Reporting Program requires the Discharger to monitor effluent flow, but only estimate discharge flow to the Land Application Area.

RESPONSE to Recommendation 2: The comparison of Caruthers discharge to domestic waste discharges is nonsensical. Based on 2006 data, historical BOD loadings were likely on the order of 700 to 800 lbs/acre/day. Since Caruthers Raisin has installed aerobic treatment to lower its effluent BOD and expanded its land area, limited available groundwater data indicates that groundwater has shown some improvement. Further, the

Order has been modified to limit cycle loading averages to 150 lbs/acre/day. To ensure that conditions that led to legacy groundwater degradation are not continued, the Order has been modified to include a Provision requiring Caruthers Raisin to complete a site-specific two year loading study and groundwater evaluation. This study requires Caruthers Raisin to evaluate its BOD loading rates, best management practices (BMPs), and groundwater quality and determine if the existing BOD limit of 150 lbs/acre/day will continue to be protective of groundwater and monitor groundwater quality improvements over time given the continued discharge and the conditions specified in the Order. At the end of the study the Order may be re-opened, should more restrictive limits be necessary.

RESPONSE to Recommendation 3: There is a meter on the flow prior to entering the three aboveground holding tanks. What goes into the tanks is what is applied to the fields each day. Thus, the flow to the tanks each day is a reasonable approximation of waste water being applied to the field. Caruthers Raisin has added a flow meter to its irrigation well in order to establish additional flows of irrigation water that is applied to the fields. Nonetheless, Caruthers Raisin is looking at modifications to its treatment system that could compromise flow readings. The Order has been modified to require a flow meter be installed after treatment, but prior to blending with well or other irrigation water.

JO ANNE KIPPS (JK) – COMMENT No. 3: Finding 14 states the Land Application Area's irrigation system is divided into seven sections and wastewater application is rotated between the sections on a seven-day cycle, and that additional irrigation water may be needed to meet crop demand. **Recommendation 4:** The Tentative Order should include a finding describing the Discharger's water balance, which is typically included in a report of waste discharge to land and calculated on a monthly basis using an annual rainfall total representing a wet year of 100-year frequency. While additional irrigation water may be required during the summer months, do wastewater application rates exceed crop demand during the late summer and fall, as well as winter and spring? A description of the Discharger's water balance should answer these questions. **Recommendation 5:** The Tentative Order should identify the acreage of the seven sections (e.g., are they equal-sized sections of about four acres each?). This information is necessary to evaluate staff's characterization of the discharge's anticipated BOD loadings cited in Finding 22. Assuming the irrigation sections are about four acres each and that the discharge BOD is about 3,500 mg/L (2009 characterization described in Finding 10), the instantaneous BOD loading at the proposed 0.13 mgd monthly average discharge flow limit will be almost 950 lbs BOD/acre. This loading represents a significant organic shock load that will rapidly deplete soil oxygen. The reducing conditions that occur under such high organic loading are necessary to denitrify applied nitrogen, but may also mobilize arsenic, iron, and manganese, which, absent sufficient attenuation in the soil profile, may be released to groundwater in concentrations exceeding applicable water quality objectives. **Recommendation 6:** The Tentative Order should require the Discharger to monitor soil-pore liquid at the bottom of the effective soil treatment zone (i.e., the bottom of the root zone) for, at a minimum, total organic carbon, iron and manganese, and nitrate. This

requirement is reasonable and appropriate to monitor the effectiveness of soil treatment in decomposing applied BOD and nitrogen and attenuating other applied waste constituents. The resulting data are necessary to evaluate: (a) whether BOD loading rates authorized by the Tentative Order are sufficiently conservative to ensure that adequate organic decomposition occurs within the treatment or root zone and will not cause excessive mobilization of iron and manganese, and (b) whether waste application practices (e.g., instantaneous loadings and rest intervals) are optimized to preclude the leaching of nitrate below the root zone.

RESPONSE: The Findings and Information Sheet of the Order have been modified to include a description of Caruthers water balance. Based on the water balance, there is sufficient hydraulic capacity to handle flows during winter months, except during periods of heavy rainfall. The Discharger has indicated that processing operations will cease during periods of prolonged rainfall or when soil conditions become saturated, since most of the support areas for the operation remain uncovered. The Order has specific conditions which prohibit the Discharger from applying process wastewater to the Reuse Area within 24 hours of a storm event of measurable precipitation or when soils become saturated.

In response to Recommendations 5 and 6, the Order has not been modified to require soil-pore liquid monitoring as an on-going parameter. Soil-pore liquid or vadose zone monitoring is intended to detect pulses of waste constituents as they pass below the treatment zone of the upper soil. However, collecting a sufficient sample for analysis at land application sites, such as at Caruthers Raisin, where there are semi-arid conditions and irrigation efficiency is high due to the use of sprinklers, the possibility of collecting a sufficient volume of sample for analysis is very low. In addition, installing lysimeters over a large area disturbs the soil profile which in turn can create preferential pathways, thus decreasing the level of treatment and affect the validity of the sampling results. Another problem with vadose zone monitoring is that there is generally no way to tell how long the samples have been held in the collection vessel. If the sample is too old, holding times might have expired or the sample may have been compromised due to on-going reactions. Therefore, Central Valley Water Board staff does not believe that soil-liquid pore monitoring is a reliable or useful tool at this time.

JO ANNE KIPPS (JK) – COMMENT No. 4: Finding 22 includes the following regarding the Guidance Manual prepared by the California League of Food Processors:

The Guidance Manual prepared by the California League of Food Processors (CLFP) establishes risk categories for land application of food processing wastewater. Based on current BOD loading rates, the discharge falls within Risk Category 1 for organic loading during the light processing season (November through June), and Risk Category 2 for the peak processing season (July through October). According to the CLFP Guidance Manual, organic loading which falls within Risk Category 1 poses a de-minimus risk indistinguishable from common agronomic conditions and Risk Category 2 poses a

minimal risk of unreasonable degradation of groundwater provided reasonable care is taken to evenly distribute the wastewater and properly manage the land application area.

While CLFP consulted Central Valley Water Board staff during its preparation of its Guidance Manual, Central Valley Water Board public records include staff correspondence to CLFP describing the Guidance Manual's positive aspects as well as its deficiencies. As described in this correspondence, the Guidance Manual's theoretical model of land treatment relies upon untested assumptions on the rate of oxygen transfer into soil following applications of high-BOD wastewater. The Guidance Manual describes how to use the theoretical model to design a land application system, including its maximum BOD loading rates and minimum drying intervals. It has not, however, been subjected to a scientific peer review and has not, to date, been proposed by staff for consideration by the Central Valley Water Board to approve its use by staff as a technical guidance document. **Recommendation 7:** The Tentative Order should delete all references to the Guidance Manual. This includes references in Finding 22 and Finding 46, which states, the Discharger "provides treatment and control of the discharge that incorporates ... organic loading rates consistent with those recommended by the California League of Food Processors as unlikely to cause unacceptable groundwater degradation." This also includes references to the Guidance Manual in the Tentative Orders Information Sheet.

RESPONSE: No changes have been made. References to the CLFP Manual included in the Order do not state that organic loading rates under Risk Categories 1 and 2 will be protective of groundwater. Instead, they are intended to show that Caruthers Raisin is implementing treatment and control measures consistent with those promoted by the industry to limit the potential for groundwater degradation. The assertion that the oxygen diffusion model presented in the CLFP Manual should not be used since it has not been tested is not germane to the TWDRs, as the model has not been used to calculate the proposed loading rates contained therein.

JO ANNE KIPPS (JK) – COMMENT No. 5: Finding 29 characterizes the Plant's source water, which is supplied by two on-site wells, as exhibiting 300 micromhos per centimeter ($\mu\text{mhos/cm}$) electrical conductivity at 25 degrees Centigrade (EC) and less than 3 mg/L NO_3^- -N. Finding 30 presents average concentrations in the Dischargers three shallow groundwater monitoring wells based on data collected from 2005 to 2008. The data show that upgradient groundwater exhibits an EC of 840 $\mu\text{mhos/cm}$, which is below the Title 22 recommended secondary maximum contaminant level of 900 $\mu\text{mhos/cm}$. As such, groundwater underlying and upgradient from the discharge area is high quality water and the Central Valley Water Board is obligated to ensure that the Waste Discharge Requirements Order it adopts to authorize the discharge is consistent with State Water Resources Control Board Resolution 68-16, (Policy with Respect to Maintaining High Quality Waters of the State).

RESPONSE: This is a statement. No response is necessary.

JO ANNE KIPPS (JK) – COMMENT No. 6: Finding 33 discusses the data presented in Finding 30 and indicates that the concentrations of iron and manganese in groundwater downgradient of the 5-acre disposal area exceed applicable water quality objectives of 0.3 mg/L and 0.05 mg/L, respectively. As stated in Finding 43, Resolution 68-16 “prohibits degradation of groundwater unless it has been shown that the degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives....” Finding 45 describes the public benefits of the Dischargers operation and states, “Provided that discharges from the Plant comply with State and Central Valley Water Board plans and policies, authorized degradation due to the continued operation of Caruthers Raisin is to the maximum benefit to the people of the State.” The discharge has already caused groundwater to contain iron and manganese in concentrations exceeding applicable water quality objectives. Excessive past loadings to the 5-acre disposal area have likely saturated the soil profile with waste constituents in concentrations that threaten continued groundwater degradation. **Recommendation 8:** The Tentative Order should be revised to prohibit discharge to the original 5-acre disposal area, because past discharges to this area have degraded groundwater, caused exceedances of water quality objectives for iron and manganese, and caused groundwater to contain excessive amounts of total organic carbon, which exerts an oxygen demand and promotes reducing conditions that, in turn, promote the mobilization of iron and manganese, as well as arsenic. This prohibition is necessary for the Tentative Order to comply with Resolution 68-16, and will require the Discharger to modify its discharge. The Tentative Order should establish a time schedule for the Discharger to either (a) acquire additional land application acreage, (b) reduce wastewater flows, and/or (c) reduce concentrations of decomposable waste constituents to levels that will not overload portions of the land application area that have not been used for waste disposal.

RESPONSE: The recommended prohibition has not been added. Recent groundwater data has shown improvement in groundwater quality beneath the 5-acre site with respect to iron and manganese (See response to JK Comment No. 7 below). The Order includes discharge specifications that limit the BOD loading rate to the 5-acre disposal area to a cycle average of 150 lbs/acre/day, which is far less than historical loading rates. The TWDRs also require Caruthers Raisin to evaluate its current discharge and BMPs as part of a two year loading study and groundwater evaluation. The loading study and groundwater evaluation will also include the former 5-acre disposal area. (See also Response to JK Comment No. 2).

JO ANNE KIPPS (JK) – COMMENT No. 7: Finding 34 states, “It is anticipated that with the reduced organic load and implementation of best management practices (BMPs) that water quality beneath the site will improve over time. This Order includes a provision requiring Caruthers Raisin to expand its monitoring well network including replacement of dry monitoring wells and continued groundwater monitoring to confirm this.” **Recommendation 9:** The

Tentative Order should provide technical information that supports this conclusionary statement, as explained below.

RESPONSE: As described in the Findings of the TWDRs, in 2006 Caruthers Raisin implemented treatment measures to lower the BOD concentration of its discharge. It also increased its application acreage and switched to sprinkler irrigation. In May 2011, following the recent rains, groundwater levels in the area rose sufficiently to allow Caruthers Raisin to sample two of its monitoring wells. The third monitoring well MW-3 remained dry. The May 2011 sampling shows groundwater iron, manganese, and arsenic concentrations in MW-2 (down gradient) have decreased significantly compared to previous sampling events, indicating improvement in groundwater quality. In May 2011, iron and arsenic concentrations in MW-2 were both below water quality objectives, and manganese concentrations, while still above the secondary MCL of 0.05 mg/L, at 0.41 mg/L were almost six times lower than during previous sampling events. EC and TDS concentrations in MW-2 at 1,300 umhos/cm and 780 mg/L increased slightly and still exceed recommended lower secondary MCLs, but they are below the upper secondary MCLs. EC and TDS also increased in MW-1 (upgradient) at the same magnitude as MW-2, indicating a possible source other than the discharge.

The May 2011 sampling event provides evidence that suggests that groundwater is self-remediating over time, as expected. Continued groundwater monitoring, as required by this Order, will confirm the continuation of this trend. If this trend does not continue, the Discharger will be subject to more stringent requirements and enforcement.

JO ANNE KIPPS (JK) – COMMENT No. 8: Finding 44 identifies the constituents of concern in the discharge that have the potential to degrade groundwater and states, “Groundwater iron and manganese degradation from historic operations should self-remediate over time and this Order requires Caruthers Raisin to expand the Plant’s groundwater monitoring well network to monitor remediation progress.” **Recommendation 10:** The Tentative Order should provide technical information to support this finding’s assumption that groundwater conditions underlying the original 5-acre disposal area will “self-remediate over time,” especially since the proposed discharge will continue to load the area with organic and salt waste constituents. Given the extremely high loadings to the original 5-acre disposal area (recall that above I estimated the past discharges BOD loading as equivalent to that of 25,000 people!), the Central Valley Water Board should not authorize the continued discharge of high-BOD wastewater to the original 5-acre disposal area with the hope that someday, somehow, groundwater conditions will improve over time. Indeed, the issue of groundwater degradation caused by the Discharger’s past practices is better addressed through the issuance of a Cleanup and Abatement Order pursuant to CWC ' 13304 rather than in a Waste Discharge Requirements Order that ostensibly complies with the Basin Plan and Resolution 68-16. **Recommendation 11:** In the event staff does not concur with Recommendation 8 to prohibit further discharge to the original 5-acre disposal area, the Tentative Order should be revised to

prohibit discharge to this area at least until concentrations of total organic carbon in groundwater downgradient of the 5-acre disposal area decrease to levels representative of background conditions.

RESPONSE: See responses to JK Comment Nos. 6 and 7.

JO ANNE KIPPS (JK) – COMMENT No. 9: Finding 44.c indicates that groundwater salinity as measured by EC and Total Dissolved Solids (TDS) is elevated in downgradient monitoring wells compared to background and states, “It is believed that the elevated EC and TDS concentrations are, in part, the result of increased bicarbonate in down-gradient wells due to past organic overloading of the Land Application Area. The reduced organic load and implementation of BPTC measures should result in the reduction of groundwater for EC and TDS increases due to organic loading.” Projections of what groundwater conditions will be under the improved discharge operation should be based on site-specific technical evidence and sound technical assumptions, not on faith. Indeed, this sentence appears to reflect staff’s uncertainty in identifying the discharge’s potential to impact groundwater from salinity constituents that are released to groundwater from the soil treatment of applied BOD. The BOD loadings authorized by the Tentative Order – almost 1,000 lbs BOD/acre on the day of application – will continue to create bicarbonate alkalinity, as well as elevated hardness (calcium and magnesium), which will continue to leach into and degrade groundwater. While the Basin Plan does not establish water quality objectives for bicarbonate alkalinity and hardness, these constituents contribute to groundwater EC and TDS, which do have water quality objectives. **Recommendation 12:** Finding 44.c should be revised to provide convincing technical evidence that groundwater conditions will improve under the improved discharge operation.

RESPONSE: See response to JK Comment No. 7.

JO ANNE KIPPS (JK) – COMMENT No. 10: Finding 55 describes the Mitigated Negative Declaration that Fresno County adopted in March 2005 in accordance with the California Environmental Quality Act (CEQA). The Mitigated Negative Declaration covers the Dischargers Plant upgrades and reuse of processing wastewater for irrigation on crops. **Recommendation 13:** The Tentative Order should also cite and describe the CEQA document for the Plants construction and operation and its associated wastewater disposal operation.

RESPONSE: The finding has been modified to include information on the construction of the Facility and the CEQA processes through which Caruthers Raisin has gone.

JO ANNE KIPPS (JK) – COMMENT No. 11: Finding 59 indicates the discharge should be classified as Category 2 threat to water quality and Category B complexity. **Recommendation 14:** The discharge complexity should be classified as Category A because the Tentative Order requires the Discharger to install and operate a groundwater

monitoring well network. This is consistent with the definition of Category A complexity in Title 23, California Code of Regulations, ' 2200, which defines Category A complexity as: "Any" discharge of toxic waste, any small volume discharge containing toxic waste or having numerous discharge points or ground water monitoring, or Class 1 waste management unit" (emphasis added).

RESPONSE: No change has been made. The State Water Resources Control Board recently adopted emergency fee regulations clarifying that it was not its intent to classify every discharge with groundwater monitoring as a Category A complexity.

JO ANNE KIPPS (JK) – COMMENT No. 12: The Tentative Order prescribes several effluent limitations (i.e., for EC, boron, and chloride) but fails to prescribe an effluent limitation for BOD to reflect the Dischargers operation of the Plants wastewater treatment system. Without an effluent limitation for BOD and regular BOD monitoring of the discharge for compliance with this effluent limitation, how can the Central Valley Water Board be assured that the Discharger will continue to optimally operate and maintain the Plants wastewater treatment system? Evaluation of discharger's compliance with prescribed BOD loading rates is complicated by the large amount of land application monitoring that is required. Often times, dischargers do not expend the necessary resources to conduct this monitoring as specified. Establishment of an effluent BOD limit will expedite staff's evaluation of the discharger's compliance with the Tentative Order's BOD loading rates. **Recommendation 15:** The Tentative Order should prescribe an effluent limitation for BOD that reflects the optimal operation of the Plants wastewater treatment system, which the Tentative Order in Findings 11 and 34 indicates is capable of reducing influent BOD by 50 percent. The effluent limitation may be expressed as a monthly average BOD removal of 50 percent or a monthly average BOD concentration of 3,500 mg/L. Either limit would require the Discharger to operate and maintain the Plants wastewater treatment system as designed. Establishment of a BOD effluent limitation will also facilitate staffs evaluation of the Dischargers compliance with Prohibition A.2, which concerns treatment bypass.

RESPONSE: No change has been made. Regulation of the discharge through the BOD loading rate limits to the Reuse Areas are sufficient.

The Monitoring and Reporting Program requires sampling for both influent and effluent BOD. This data can be used by the Discharger and staff to evaluate the performance of the treatment system in the event there are problems in meeting the BOD loading limit prescribed in the Order.

JO ANNE KIPPS (JK) – COMMENT No. 13: Land Application Area Requirement D.4 establishes monthly average BOD loading rates of 125 lbs/acre/day from July through October and 50 lbs/acre/day from November through June. The Tentative Order does not provide sufficient technical information to justify these BOD loading rates as protective of groundwater

quality. Indeed, the question of what constitutes a protective BOD loading in land treatment systems has not been satisfactorily addressed in the technical literature. The issue of BOD loading and its potential to degrade groundwater was discussed in two staff presentations to the Central Valley Water Board on 28 January 2005 and 17 March 2006. **Recommendation 16:** The Tentative Order should identify the prescribed BOD loadings as those reflecting the Dischargers proposed soil treatment and disposal operation, and not assert that these prescribed rates are protective of groundwater quality. The Tentative Order should require the Discharger to periodically monitor soil-pore liquid to assess the potential for the discharge – as conducted in accordance with the prescribed loadings – to unreasonably degrade groundwater. Simply put, if the soil pore liquid contains excessive concentrations of total organic carbon, then the BOD loading rates should be reduced until total organic carbon concentrations are comparable to background groundwater levels (i.e., around 0.75 mg/L, as indicated in Finding 30). The Tentative Order should include a provision allowing the Central Valley Water Board to reopen the Order to prescribe lower BOD loading rates in the event that soil-pore liquid monitoring (and groundwater monitoring) demonstrates prescribed loading rates threaten to violate the Orders groundwater limitations.

RESPONSE: A statement has been added to the Information Sheet that the BOD loading limits prescribed in the Order reflect Caruthers Raisin’s best efforts to reduce organic loading to the Reuse Area, and that the Order requires Caruthers Raisin to complete a two year loading study and groundwater evaluation to demonstrate that the BOD loading limits prescribed are protective of groundwater.

A re-opener has been added to include the following statement:

“If the Central Valley Water Board determines that waste constituents in the discharge have a reasonable potential to cause or contribute to an exceedance of an objective for groundwater, this Order may be reopened for consideration of more stringent requirements including additional restrictions or revision of appropriate numerical effluent or groundwater limitations.”

JO ANNE KIPPS (JK) – COMMENT No. 14: The Tentative Order’s Monitoring and Reporting Program identifies the constituents to be monitored in the Plants wastewater treatment systems influent and effluent, as well as soil, source water, and groundwater.

COMMENT No. 14.1 / Recommendation 17: The MRP should require monitoring of influent and effluent for BOD and nitrogen compounds to occur on the same day, so that the data can be used to accurately calculate the percent BOD and nitrogen removals provided by screening and aeration treatment.

RESPONSE: The Order has been modified to reflect this change.

COMMENT No. 14.2 / Recommendation 18: The MRP should include total phosphorus in the General Mineral list of constituents and parameters. Phosphorus data are necessary to allow for periodic evaluations of discharge quality, in part, to determine whether there is sufficient phosphorus in the discharge for optimal biological decomposition of applied decomposable waste. The data are also useful to evaluate groundwater conditions and the effectiveness of soil treatment.

RESPONSE: The Order has been modified to reflect this change.

COMMENT No. 14.3 / Recommendation 19: The MRP should include potassium as a constituent to be monitored in soils (both background and affected soils). Raisin processing wastewater typically contains very high potassium concentrations. Unless applied potassium is sufficiently attenuated in the soil profile (e.g., by plant uptake or soil absorption), the discharge may release potassium to groundwater in concentrations that threaten exceedances of the groundwater limitation for EC. Monitoring for soil potassium will provide necessary data to evaluate the extent of soil attenuation of this constituent.

RESPONSE: No change has been made. Potassium does not appear to be an issue at this site. While not specifically analyzed for potassium, the fixed dissolved solids of the discharge is relatively low and groundwater monitoring has shown potassium concentrations similar to background with little variation between up-gradient and down-gradient wells. The MRP includes effluent and groundwater sampling for potassium. Therefore, including potassium as part of the soil monitoring program is unnecessary at this time.

COMMENT No. 14.4 / Recommendation 20: The MRP should require effluent flows to the Land Application Areas to be monitored continuously via meter, not merely estimated. Accurate flow data are necessary to generate accurate results for waste constituent loadings.

RESPONSE: See response to JK Comment No. 2.

COMMENT No. 14.5 / Recommendation 21: The MRP should specify that samples collected from groundwater monitoring wells should be filtered prior to acid preservation to ensure accurate analytical data on groundwater metals (e.g., iron and manganese).

RESPONSE: The Order has been modified to reflect this change.

COMMENT No. 14.6 / Recommendation 22: The MRP should require the Discharger to submit a map showing the locations of the parcels comprising the Land Application Area that are irrigated separately, and the parcels' identification numbers

and acreages. It should require the Discharger to identify on a daily basis the parcel receiving the discharge. It should also require reporting of monthly average BOD loadings for each parcel (as opposed to cycle average BOD loadings) in quarterly monitoring reports. This is necessary to allow staff to evaluate on a quarterly basis the Dischargers compliance with the Tentative Orders BOD loadings, which are expressed in terms of monthly average rates.

RESPONSE: Caruthers Raisin routinely provides the field identification numbers, flows, and acreage on a daily basis as part of its current monitoring program, so the Order has been modified to require this level of monitoring to continue. With regards to BOD loadings, the Order has been changed to set the BOD loading limit to the Reuse Areas as a cycle average. Therefore the BOD loading monitoring requirement is now consistent with the limit and the MRP has not been changed.