THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS
ACTION AGENDA SUMMARY

DEPT: ENVIRONMENTAL RESOURCES **BOARD AGENDA #** *B-6

Urgent ☐ **Routine** ■ **AGENDA DATE** December 18, 2007

CEO Concurs with Recommendation YES ☒ **NO** ☐ **4/5 Vote Required YES** ☒ **NO** ☐
(Information Attached)

SUBJECT:

Authorization to Enter into an Agreement with the California State University, Fresno Foundation for a Food Processing By-Product Research Project

STAFF RECOMMENDATIONS:

1. Authorize the Director of the Department of Environmental Resources, or her designee, to enter into a Professional Services Agreement for an amount not to exceed $120,000, with the California State University, Fresno Foundation for a Food Processing By-Product Research Project.

2. Authorize the Department of Environmental Resources to contribute $46,704.56 of funding to the Food Processing By-Products Research Project.

3. Direct the Auditor-Controller to increase appropriations in the amount of $50,000 per the attached Budget Journal Form.

FISCAL IMPACT:

The current balance in Fund 1011, Food Processing By-Product Research Project, is $73,295.44. This balance includes Stanislaus County's contribution of $30,000 for Fiscal Year 2006-2007, fees collected on food processing by-products used within the County from July 2006 through December 10, 2007, and accumulated interest.

(Fiscal Impact Continued on Page 2)

BOARD ACTION AS FOLLOWS: No. 2007-998

On motion of Supervisor Mayfield , **Seconded by Supervisor** Grover
and approved by the following vote,
Ayes: Supervisors: Mayfield, Grover, Monteith, DeMartini, and Chairman O'Brien
Noes: Supervisors: None
Excused or Absent: Supervisors: None
Abstaining: Supervisor: None

1) X **Approved as recommended**
2) _____ **Denied**
3) _____ **Approved as amended**
4) _____ **Other:**
MOTION:

Christine Ferraro

ATTEST: CHRISTINE FERRARO TALLMAN, Clerk **File No.**

FISCAL IMPACT: (Continued)

Per the proposed agreement, the amount of funding that would be paid to the California State University, Fresno Foundation is $120,000. Since authorized funding and fees collected total $73,295.44, the Department is requesting authorization to contribute an additional $46,704.56 to satisfy the obligation from its Environmental Resources main budget.

DISCUSSION:

On June 13, 2006, the Stanislaus County Board of Supervisors authorized the Director of Environmental Resources to support a Tentative Resolution with the Central Valley Regional Water Quality Control Board (CVRWQCB) regarding the reuse of food processing by-products within Stanislaus County.

The Tentative Resolution allows Stanislaus County and the reuse sites to continue to operate the Food Processing By-Products Use Program through the 2007 calendar year provided that the required progress is made toward the completion of the Research Project to determine if the Stanislaus County program provides adequate protection of both surface and groundwater.

The Tentative Resolution, formally adopted by the CVRWQCB on June 22, 2006, itemized several deliverables, including: a review of related literature, a technical review of accumulated program data, the development of a field-ready manual of best practices, and an Ordinance that provides for the implementation and enforcement of the Food Processing by-Products Program. The aforementioned deliverables constitute the Research Project.

The pre-proposal, dated August 28, 2006, from the California State University-Agricultural Research Initiative and California State University, Fresno Foundation estimated the required funding from Stanislaus County to be $130,000 for the completion of the Research Project. That estimate has since been refined to $120,000 in the proposed contract (Attachment "A").

In order to fund the Research Project, the Stanislaus County Board of Supervisors has previously authorized the Department of Environmental Resources (Department) to contribute $30,000 for the Fiscal Year 2006-2007, authorized the creation of an interest bearing special revenue fund for the Research Project, authorized the Director of the Department to accept funding from public and private individuals and organizations desiring to contribute to the Research Project, and approved a $0.10 per ton fee on food processing by-products used within Stanislaus County.

At the outset of the project, the California Agricultural Technology Initiative (CATI), representing the California State University, Fresno Foundation agreed to begin work on the Research Project using $162,000 in grant funding from the California State Agricultural Research Initiative Specialty Crop Master Grant (ARI). During this period, Stanislaus County's contribution was in the form of in-kind services necessary to complete the Research Project.

It is now necessary for Stanislaus County to make its financial contribution to the Research project. The first version of the contract for the Research Project was received in August 2007, and it is in

final form at this time. The total budget for this project is $282,000. Stanislaus County is to provide $120,000. The balance of $162,000 has already been contributed by ARI. A scope of work dated June 26, 2006 (Attachment "B") and project budgets (Attachments "C" and "D") are attached to this report.

Department staff will return to the Board in January 2008 with an update of the Food Processing By-Products Program and to request adoption of the Food Processing By-Products Ordinance and Regulations.

POLICY ISSUE:

The Board of Supervisors should decide if continuing to support of the Tentative Resolution with the CVRWQCB by fully funding the Research Project supports the Board's priorities of a strong agricultural economy / heritage, a well-planned infrastructure, and helps fulfill the County's mandated landfill diversion requirements.

STAFFING IMPACT:

There are no staffing impacts associated with this request.

AGREEMENT FOR PROFESSIONAL SERVICES
BETWEEN
CALIFORNIA STATE UNIVERSITY, FRESNO FOUNDATION
and
STANISLAUS COUNTY

WHEREAS, Stanislaus County, hereinafter referred to as **"the County"**, requires short and long-term environmental impact of direct land application of food processing by-products as set forth in the County Program requirements "Stanislaus County Food Processing By-Product Use Program May 2006"; and

WHEREAS the California State University, Fresno Foundation hereinafter referred to as **"Contractor"** has agreed to participate in this effort;

NOW THEREFORE, Stanislaus County and the **Contractor** agree as follows:

ARTICLE I
SCOPE OF SERVICES

A. The **Contractor** agrees to contribute to the overall goals and objectives of the Funding Contract by providing professional and/or technical services to **the County,** in accordance with and pursuant to the details of this Agreement for Professional Services, and specifically Attachment A - Scope of Work, which is attached hereto and incorporated herein by this reference ("Work").

B. The **Contractor** shall perform the specified Work and shall furnish all labor, materials, supplies, equipment, supervision, and services for and incident to the performance of the Work.

C. The Services covered by this Agreement shall be performed in accordance with the provisions herein, including all Attachments.

D. With respect to the required Work, the **Contractor** agrees to be bound to **the County** except as expressly provided herein.

E. In consideration of services rendered, **the County** agrees to pay the **Contractor** in accordance to the provisions of Article IV.

ARTICLE II
GENERAL PROVISIONS

A. This Agreement, including attachments, shall form the entire agreement and understanding between **the County** and the **Contractor.** Except as provided in Article

VII hereof, no other written or verbal statements, shall be binding upon the parties or construed as modifying this Agreement in any way.

B. The governing law of this Agreement shall be the law of the State of California, excluding its choice of law provisions. The parties agree that Fresno County is the sole proper venue for the litigation of any and all disputes arising out of or relating to this Agreement.

C. The **Contractor** is an independent contractor and will maintain complete control of and responsibility for its employees, agents, methods, and operations.

D. Execution of the Agreement by **the County** will be authorized for the **Contractor** to proceed with the Work and Services specified herein.

E. Programmatic and Fiscal Communications to **the County** shall be directed to:

Name:	Sonya Harrigfeld
Title:	Director
Address:	Stanislaus County Department of Environmental Resources 3800 Cornucopia Way, Suite C Modesto, CA 95357
Phone:	(209) 525-6700 FAX: (209) 525-6773
Email:	harrigfeld@envres.org

Programmatic Communications to **Contractor** shall be directed to:

Name:	Joe Bezerra
Title:	Executive Director/Director of Operations California State University Agricultural Research Initiative (ARI)
Address:	California Agricultural Technology Institute (CATI) 2910 E. Barstow Avenue M/S OF115 Fresno, CA 93740-8009
Phone:	(559) 278-2361 FAX: (559) 278-4949
Email:	buzzb@csufresno.edu

Fiscal Communications to **Contractor** shall be directed to:

Name:	Linda Christian
Title:	Grant Accounting Supervisor
Address:	4910 N. Chestnut Fresno, CA 93726
Phone:	(559) 278-0852 Fax: (559) 278-0992
Email:	lindacar@csufresno.edu

ARTICLE III
TERM

The term of this Agreement shall be from December 1, 2007 through June 30, 2009.

ARTICLE IV
CHARGES, INVOICING, AND PAYMENT

A. The total to be paid by **Stanislaus County** to the contractor shall not exceed **$120,000** for the period indicated above. The **Contractor** will submit, in arrears, an itemized invoice along with supporting documentation, to **Stanislaus County** on a quarterly basis for services rendered in accordance with specified line items in Attachment B, Itemized Budgets. The final invoice shall be received no later than June 30, 2009.

B. Within 20 business days following receipt of invoice, and subject to the provisions of Article IV(A), Stanislaus County will pay the **Contractor** for the approved invoice amount.

ARTICLE V
INDEPENDENT CONTRACTOR STATUS

This Agreement is by and between two independent contractors, and is not intended to and shall not be construed to create the relationship of employer, employee, partnership, agent, servant, or joint venture with the **Contractor** or any persons employed by or representing the **Contractor** including subcontractors or employees thereof. The **Contractor** shall control the manner and means of accomplishing the performance of the Agreement.

ARTICLE VI
INSURANCE AND INDEMNIFICATION

A. The **Contractor** shall maintain throughout the period of this Agreement the following insurance coverages, which shall be written on an "occurrence" basis:

1. Worker's Compensation and Employer's Liability insurance, as required by law;
2. Comprehensive General, Bodily Injury, and Property Damage Insurance, with $1,000,000 combined single limits; and
3. Comprehensive Automobile Liability for owned and rented/leased vehicles, including Bodily Injury and Property Damage coverage, with $1,000,000 combined single limits.

B. Unless otherwise expressly set forth in this Agreement, each party shall indemnify, defend, and save harmless the other, and their various directors, officers, agents, employees, boards, commissions, and departments, from and against any and all loss, damages, suits, claims (including actions by administrative agencies), penalties, costs, liabilities and expenses (including, but not limited to, a reasonable investigation, legal and paralegal expenses), that may arise out of this Agreement or the parties' respective

performance hereunder provided that any such loss, damages, suits, claims, penalties, costs, liabilities and/or expenses does not arise out of the intentional or negligent acts or omissions of the indemnity or its various directors, officers, agents, employees, boards, commissions, and departments.

ARTICLE VII
MODIFICATIONS

The terms of this Agreement and its attachments may be modified or amended only by a written instrument signed by both parties hereto.

ARTICLE VIII
INCORPORATED TERMS

The following General Terms and Conditions are hereby incorporated:

A. OMB Circulars A-21, A-110 and A-133.
http://www.whitehouse.gov/obm/circulars/index.html

Use A-87 when contracting with State and Local Government and Tribal entities.

ARTICLE IX
DISPUTES

The parties may pursue their respective remedies at law or equity for any claim, controversy, or dispute relating to this Agreement.

ARTICLE X
NON-ASSIGNMENT

Neither party shall assign, transfer, or further subcontract this Agreement, in whole or in part, without prior written approval of the other.

ARTICLE XI
SEVERABILITY AND SURVIVAL

If any of the provisions herein are held for any reason to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability will not effect any other provision, and this Agreement will be construed as valid, legal and enforceable in all other respects.

ARTICLE XII
TERMINATION

A. Each party retains the right to terminate this Agreement without cause upon thirty (30) days' advance notice to the other. Each party retains the right to terminate this

Agreement for cause upon twenty-one (21) days' advance written notice to the other, which notice shall specify the cause.

B. After termination, the **Contractor** will be reimbursed for Services rendered and necessary expenses incurred to the termination date upon submission of an invoice to Stanislaus County.

ARTICLE XIII
ENTIRE DOCUMENT

This Agreement represents the entire agreement between the parties and supersedes all prior agreements and understandings.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives, as follows:

CONTRACTOR

California State University, Fresno Foundation
4910 N. Chestnut
Fresno, CA 93726
(559) 278-0850/FAX (559) 278-0992

By _____
Thomas McClanahan
Associate Vice President, CSUF-ORSP

Date 1/10/08

By _____
Keith Kompsi
Director, Foundation Financial Services

Date 1-10-08

STANISLAUS COUNTY

County of Stanislaus
Department of Environmental Resources
3800 Cornucopia Way, Suite C
Modesto, CA 95351
(209)525-6700

By _____
Sonya Harrigfeld
Director

Date 1/15/08

Approved on to Form:
Michael H. Krausnick
County Counsel

By _____
John P. Doering
Assistant County Counsel

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Food Processing By-Products Land Application:
The Stanislaus County Model

By

Joe A. Bezerra
Executive Director/Director of Operations
California State University Agricultural Research Initiative
California Agricultural Technology Institute
College of Agricultural Sciences and Technology
California State University, Fresno

And

Sajeemas Pasakdee,
Soil Scientist
California Agricultural Technology Institute
College of Agricultural Sciences and Technology
California State University, Fresno

Submitted for
California State University Agricultural Research Initiative
2006-07 Specialty Crop Grant Funding
Funding

June 26, 2006

Abstract

Stanislaus County established a voluntary Food Processing By-Products Use Program (hereafter "Program") to divert solid and semi-solid food processing by-products from the County's landfills in 1978. Under the Program the County permits food processors (both within and outside the County) to transport food processing by-products for use in land application, direct animal feed, dehydration, and composting operations. The type of solid and semi-solid food processing by-products historically included in the Program include rejected fruit and vegetable products, solids screed from food processing wastewater, wastewater, and nutrient- and organic-rich sediment generated from the recycling of water in food processing flume conveyance systems. The County and its permit holders (i.e., the entities accepting the by-products) contend that solid and semi-solid food processing by-product is a valuable commodity which improves soil and nourishes animals; the diversion of such by-products from landfills is of public benefit; and the regulated operations are environmentally sound. This project will address the short and long-term environmental impact of direct land application of food processing by-products as set forth in the County Program requirements *"Stanislaus County Food Processing By-Product Use Program May 2006"*.

Statement of the Problem

While the California Central Valley Regional Water Quality Control Board (hereafter Regional Water Board) recognizes that the land application of food processing by-products has great benefit in reducing the amount of material taken to landfills and in enhancing soil structure, it is concerned that there is a possibility that certain aspects of this practice may pose a risk to groundwater quality. Therefore, the Regional Water Board has requested and Stanislaus County has agreed to commission a scientific research study to validation and/or make Best Management Practice recommendations to ensure that the County's Program is environmental sound and based on "good" science.

Background

Program History

Stanislaus County has been active in researching, implementing and developing solutions for the use of food processing by-products in the agricultural community. In 1978, Stanislaus County recognized the potential problems of handling, transporting and using food processing by-products, and has utilized a team of interested individuals representing the following: the agricultural community including the Farm Bureau, UC Extension and the Ag Commissioner's office, the Food Processing Industry, the by-product hauling companies, and the Department of Environmental Resources (department). The goal of this team has been to develop a program that would address concerns and solve problems related to the handling and use of food processing by-products. This collaboration resulted in a unique self-supporting program for the operation and oversight of food processing by-product use sites in Stanislaus County.

The Stanislaus County Food Processing By-Product Use Program (the Program) has a long history of providing beneficial uses for by-products once regarded as problematic. Since 1987, over 6,000,000 tons of by-products have been land-applied as a soil amendment, fed to cattle, or dried and processed for other beneficial applications. Additionally, the California Integrated Waste Management Board oversees the mandate for all California jurisdictions to reduce the amount of solid waste disposed of in landfills. It is their opinion that had this material been land filled, rather than diverted to beneficial uses, Stanislaus County may not be in compliance with the mandated landfill diversion requirements of AB939.

The position of the department has consistently been that the Program held the potential for use by other California jurisdictions to operate similar beneficial-use programs in partnership with their communities. In fact, the County's interpretation of the initial contact by the RWQCB was that they had an interest in providing information about the Program to other jurisdictions that needed a workable solution to common issues regarding the reuse of food processing by-products.

The department and RWQCB had discussions about the Program in the hope that the department would be able to continue to operate the Program without crippling demands on the limited resources of the RWQCB. Based in part on the department's opinion that these operations do not pose a threat to groundwater quality, staff requested a waiver of Reports of Waste Discharge (RWD) and Waste Discharge Requirements (WDR) for the beneficial use sites.

In a letter to the RWQCB dated February 15, 2006, the DER recommended that a task force should be formed to develop statewide guidelines for the handling of food processing by-products. This task force should include appropriate expertise and stakeholder representation in order to develop a program that would meet the concerns of all interested parties and may be applicable statewide.

On March 17, 2006, DER staff presented an overview of Stanislaus County's food processing by-products program to the RWQCB. As a result of the presentation and additional comments from the public, the Regional Board directed its staff to work with department staff to develop an alternative to the earlier draft waivers. DER staff met with the Executive Officer of the Regional Board to discuss outstanding issues and possible solutions. As a result of these meetings, the RWQCB issued a Tentative Resolution regarding the reuse of food processing by-products within Stanislaus County. This Tentative Resolution is significantly different from the two draft waivers proposed by the RWQCB.

The Tentative Resolution suspends any requirement for groundwater testing until the completion of the Research Project. This Research Project allows for the by-product characterization based on historical data and widely accepted best practices, as opposed to sampling each product delivered to the reuse sites. The waivers proposed earlier, incorporated both groundwater monitoring and sampling and testing of all by-products.

On May 22, DER staff submitted comments on the Tentative Resolution. After the closing date, staff contacted the RWQCB to inquire if any additional comments were submitted in regards to the Tentative Resolution. There were several submissions in support of the department's

comments to the resolution, and only one in opposition of the resolution. The Tentative Resolution was considered and adopted by the RWQCB on June 22.

On June 13, the Stanislaus County Board of Supervisors authorized $30,000 for fiscal year 2006/07 and again in fiscal year 2007/08, with the $60,000 funding to be placed in a special account for the use on the Food Processing By-Products Research Project. A public hearing is scheduled for August 15, 2006 for the Board of Supervisor to consider the adoption of a $0.10 per ton fee at each permitted site. The estimated revenue to be generated is $25,000.00 to $30,000.00 per year during the two fiscal years. Additional research projects may be included in this research project, if additional funding can be secured.

Program Requirements
The Stanislaus County Department of Environmental Resources has implemented the program requirements as specified in the California Regional Water Quality Control Board Central Valley Region Resolution No. R5-2006-0052 (Attachment A). This resolution includes the requirements in Stanislaus County's Food Processing By-Products Use Program, (May 2006), including specific soil and by-product testing is to be completed in 2006. In addition, the Del Monte Foods Company will be sampling approximately 30 loads of its by-product before it leaves its Modesto plant.

Literature Review

Introduction
The application of food processing by-products to agricultural farmlands, while certainly not new, has become increasingly widespread. This practice is important not only for the recycling nutrients back to the soil, but also for minimizing nitrogen and phosphorous pollution from by-product that would otherwise be concentrated elsewhere. An expansion of land-applied organic wastes is projected to rise because of the public concerns regarding environmental impacts and economic restraints of their disposal to landfill or incineration (O'Connor et al., 2005) and because of presumed inherent agricultural benefits.

The food processing industries in California are the leading producers of processed fruits and vegetables such as tomatoes, olives, peaches, and etc (Reed, 2006). There are various types of food processing by-products that are dependent on the source of raw material and the substances involved during the processing season. Food processing by-products are referred to as slurry, semi-solid, or solid waste produced from canneries. The influence of their applications on farmlands can vary by their constituents as well as biotic and abiotic factors. This literature review will explore available scientific information on the potential effects of food processing by-products applied on farmlands.

Food Processing By-Products Properties
A number of fruit and vegetable processing industries generate by-products/wastes that can be applied in solid, semi-solid, or slurry forms. The compositions of food processing by-products often have high variability even though they are made of similar raw material. For example, the differences in crop variety, farming location, fertility practice, etc. can significantly influence the

level of macro- and micronutrient components in fresh fruits and vegetables and in different ways. Ultimately, this may pose obstacles for establishing a general management plan for land application disposal of food processing by-products.

A number of studies reported on the biological, chemical, and physical composition of various types of food processing by-products (Chaney et al., 1992; Rogers et al., 2001). Table 1 shows chemical properties of selected food processing by-products. Characteristics of low pH, medium to high total dissolved solids (TDS), and salinity (electro-conductivity or EC) may impair soil and water quality after a land application. However, such applications to farmlands can provide a variety of essential plant nutrients as a supplement to the fertilizer program, as well as an organic source or soil amendment. Adding an organic form of nitrogen to soil was reported to maintain soil organic matter level better than adding only synthetic nitrogen fertilizer (Wander et al., 1994). Maintaining soil organic matter was considered as a major component to sustaining long-term soil fertility (Craswell and Lefroy, 2001).

Land Applications of Food Processing By-Products

Interestingly, a large number of researchers have focused on the use of these materials after being composted with other raw materials (Schaub and Leonard, 1996) rather than the direct application of these raw food processing by-products on farmlands. Composting processes help produce a stabilized and homogenous product, eliminate odor, and potential pathogens (Gardiner and Miller, 2004). However, some researchers reported the production of compost from these materials was not economically feasible (McPartland, 2005).

Table 1. Chemical composition of food processing by-products

Sources	pH	Total Solids (%)	EC	NH_4-N	NO_3-N	Org N	Total N	K	P	S	C:N	
			mS cm^{-1}	g kg^{-1} dry wt								
Tomato skins and seeds[a]	4.2	14.4	7.6	0.5	0.02	17.0	17.4	20.3	4.4	NA[b]	31	
Tomato sauce sludge[a]		5.4	28.4	3.6	0.2	0.02	13.9	14.1	2.1	9.2	NA	18
Tomato pomace[c]	NA	NA	NA	NA	NA		NA	18.0	0.1	3.0	2.0	NA
Pear waste[c]		NA	NA	NA	NA		NA	NA	14.0	0.1	2.0	4.0
Peach waste[c]		NA	NA	NA	NA		NA	NA	6.0	0.1	3.0	1.0
Grape pomace[c]	NA	NA	NA	NA	NA		NA	9.0	103.0	NA	NA	

[a]Rogers et al., 2001.
[b]'NA' is not available.
[c]Chaney et al., 1992.

The long-term research program between researchers at California State, Chico and Pacific Coast Producers, initiated in 1987 (McPartland, 2005; Singh et al., 2002), was reviewed. They assessed the effects of fruit processing by-product application on soil, plant, and water quality. Their recommendations on a number of issues for improved utilization of food processing by-products on farmlands are noted below:

1. *Land preparation*: To control surface runoff and improve the uniformity of wastewater application, land leveling and deep ripping (for shallow hardpan) were recommended. They preferred the method of hauling wet biomass from cannery and spreading directly onto the field. While this seems to be the better, more practical operation, they suggested a need for more careful investigation.
2. *Crop selection*: The growing season is critical for selecting proper crops that can tolerate wastewater application. Grass species such as Dallis grass, Bermuda grass, elephant grass, and Salina Strawberry clover were selected as well as other plants like Lab-Lab, cotton, kenaf, and crotalaria. Crops that can grow without interrupting the period of by-product application on the land are wheat, oats, and barley.
3. *Environmental Concerns*: Levels of total nitrogen and soil nitrate-nitrogen at 0-90 cm depth during this study were relatively low, and no significant change was observed during the period of this study. In addition, the plant tissue test showed the deficiency of nitrogen. In contrast, significant changes of sodium concentrations at different period with all depths were observed. An application of gypsum was suggested to correct the sodium accumulation in the soil profile. In addition, overall soil salinity levels were ranged from to 0.3 to 1.4 ds m^{-1}, which posed minimal risk to plant growth and development.

The management of food processing by-products applied on farmlands can be safely performed to minimize detrimental impacts on soil and water quality. Essential components determining fates of food processing by-products in the soil consist of adjusting cultural practices to reduce surface runoff, increase drying process, and stimulate or retard decomposition processes. Soil temperature, soil pH, C:N ratio, moisture content, and soil texture are major factors that influence soil microbial activity in controlling the availability of soil mineral nitrogen, i.e., nitrate-nitrogen and ammonium-nitrogen. In addition, a presence of certain soil bacteria under anaerobic condition can stimulate production of nitrogen gases from organic nitrogen source. Some of these factors can be manipulated effectively to synchronize crop nitrogen demand and minimize nitrate leaching to groundwater.

Summary

Public concerns on environmental impacts after land applications of food processing by-products on farmlands are rising. Reports from the previous studies can guide our future research directions to put emphasis on finding additional information to fulfill the development of the best management practices program for Stanislaus County. More research may be warranted to develop meaningful understanding of the food processing by-products characteristics and the processes affecting their fates in the soil to ensure soil attenuation and their sustainable land application.

Statement of Methodology

A literature review and appropriate scientific research study will be completed to determine (a) the impacts to groundwater from the land application of solid and semi-solid food processing by-products and (b) safeguards to protect water quality from such discharge. The literature review and necessary research will be designed to provide information with respect to the effects or threatened effects of food processing by-products on waters of the state and to help determine the appropriate regulatory mechanism for the discharge of food processing by-products on a County-wide or possibly Region-wide basis.

Technical Review of the Program

Introduction

Stanislaus County has been regulating the land application of food processing by-products to farmland since 1987. In 2005, almost fifty percent of the food processing by-products was fed directly to livestock. The program has regulated an average 300,000 tons annually. The focus of this technical review will be on the land application of food processing by-products and the potential impact that land application may have on groundwater. Staff of the Regional Board has determined that the Stanislaus County Program does protect any potential impact to surface waters.

The Principal and Co-Principal Investigators will review the Stanislaus County Food Processing By-Products Use Program requirements, Agreement for Monitoring and Reporting of Solid and Semi-Solid Food Processing By-Products Applied Under the Stanislaus County Program, the results of product sampling, the results of the soil sampling and compare them to the research and information found through a literature review.

Objective of the Technical Review

The objective of the technical review is to determine if there are any data gaps or research gaps that do not address the items listed below:

1. Determine an adequate monitoring program for the by-products, soil and groundwater considering site and by-product characteristics and conditions.
2. Evaluate and determine the actual or potential water quality impacts that (a) high strength and (b) low pH food processing by-product may have in land application practices. Develop proper controls, management measures and prohibitions (given site and waste characteristics and conditions) to address these types of food processing by-products applied to land.
3. Determine the percentage of total dissolved solids (TDS) in food processing by-products that is present as volatile dissolved solids (VDS), and how much of this VDS will degrade within the soil profile.
4. Evaluate the actual or potential impacts to groundwater of food processing by-products with a high moisture content that is applied to land prior to planting crops.

5. Evaluate the actual or potential impacts to groundwater caused by on-site storage of food processing by-products during rain events. Develop proper controls, management measures and prohibitions given site and waste characteristics to ensure storage of food processing by-products is done in a manner that is protective of groundwater quality.
6. Identify site and waste characteristics and conditions that would prohibit the application of food processing by-products to land, and
7. Establish requirements that prohibit the discharge of liquid wastes to land under the County's program.

Results of the technical review will be submitted to the Regional Water Quality Control Board Executive Officer. If data or research gaps exist then the focus of the next step will be to develop a second work plan proposal for the next phase of the research project. The second work plan will be submitted to the Regional Water Quality Control Board Executive Officer for review and comments. This next phase may include applied field science. All future work would require the approval of Regional Water Quality Control Board's Executive Officer.

Legal Assessment of the Program

On June 13,2006, the Stanislaus County Board of Supervisors adopted a recommendation to support the adoption of the Regional Water Quality Control Board's tentative resolution regarding the reuse of food processing by-products. The requirements of the resolution were presented to the Board of Supervisors so it would understand the intent and responsibilities outlined in the tentative resolution.

Assistant County Counsel John P. Doering, will provide research of the legal authority of Stanislaus County Department of Environmental Resources ability to implement and enforce the Food Processing By-Products Program. In addition, John Doering will draft a local Ordinance or other legal mechanism for adoption by the Stanislaus County Board of Supervisors for the implementation and enforcement of the Food Processing By-Products Program.

Manual of Best Practices

This ongoing two-year, or less, project is established to develop the best management practices program for land application of food processing by-products on farmlands under Stanislaus County Food Processing By-Products Program. Upon completion of the scope of work outlined within this work plan the goal is to adopt an enforcement plan that will minimize potential water quality impact after land application of the food processing by-products. To address the Regional Water Quality Control Board's resolution requirements, the following items are essential components to be considered:

1. Determine an adequate monitoring program for the by-products, soil and groundwater considering site and by-product characteristics and conditions.

2. Evaluate and determine the actual or potential water quality impacts that the high strength and low pH food processing by-products may have in land application practices.
3. Develop proper controls, management measures, conditions and prohibitions (given site and by-product characteristics) to address these types of food processing by-products application to farmlands.
4. Determine the percentage of total dissolved solids (TDS) in food processing by-products that is present as volatile dissolved solids (VDS), and how much of this VDS will degrade within the soil profile.
5. Evaluate the actual or potential impacts to groundwater of food processing by-products with a high moisture content that is applied to land prior to planting crops.
6. Evaluate the actual or potential impacts to groundwater caused by on-site storage of food processing by-products during rain events. Develop proper controls, management measures, and prohibitions given site and waste characteristics to ensure storage of food processing by-products is done in a manner that is protective of groundwater quality.
7. Identify site and by-product characteristics and conditions that would prohibit the application of food processing by-products to land.
8. Establish requirements that prohibit the discharge of liquid wastes to land under the County's program.

Timeline

Stanislaus County shall schedule meetings as necessary to apprise the Regional Water Board Executive Offices and staff as to the progress of the work described in Section 2.a of the Resolution No. R5-2006-0052.

Stanislaus County shall submit quarterly progress reports suitable for inclusion in the Executive Officer's report section of the Regional Board agenda (due by 30 September 2006, 30 December 2006 and 30 March 2007).

Major Activity (Areas/Objectives)	Performance Period
1) Preliminary results of the literature review Deadline	July 15 to July 31, 2006 (August 1, 2006)
2) Results of the literature review Deadline	July 15 to December 31, 2006 (January 1, 2007)
3) Review of 2000-06 data Deadline	January 1 to March 31, 2007 (April 1, 2007)
4) Final report due to the Executive Officer Deadline	April 1 to June 30, 2007 (July 1, 2007)
5) Develop an ordinance and enforcement Program Deadline	July 1 to December 31, 2007 (January 1, 2008)

Budget Narrative

Funding for this project is being provided by The California State Agricultural Research Initiative (ARI) "Buy California" Specialty Crop Master Grant (SCG), the Stanislaus County Board of Supervisors, and Stanislaus County food processing industry through a tipping fee collected by Stanislaus County. While the total budget commitment for this two-year project is $282,000, the one-year ARI-SCG budget commitment is $162,000. Project funding will be utilized to conduct applied research, education, outreach, and technology transfer activities related to the land application of food processing plant by-products from August 1, 2006 to July 31, 2008. This project allows the research team to proactively address an integral critical aspect of a much larger food processing industry production, environmental, and regulatory issue which potentially threatens the industry's long-term viability. The budget specifically funds research activities necessary for Stanislaus County to proactively respond to the California Regional Water Quality Control Board resolution number R5-2006-0052 regarding the reuse of food processing by-products.

Project 07-8-002-11 **Food Processing By-Products Land Application: *The Stanislaus County Model*** ***FY2006-07/2007-08 Last Updated 10-3-06***				
Account Codes	Description	ARI "Buy California" Specialty Crop Program Funding	Stanislaus County/Industry External Cash Match	Consolidated Project Budget
Salaries, Wages, and Benefits	***Subtotals***	**76,600**	**70,600**	**147,200**
601202	Part Time Faculty			0
601301	Management & Supervisory			0
601401	Regular Staff	45,600	45,600	91,200
601701	Faculty Release			0
601701	Additional Employment (Summer Salary)			0
601701	Temporary Help			0
601801	Student Assistant	7,500	4,000	11,500
601802	Bridge Student Assistant	2,500		2,500
601910	Personal Service Reserve (Benefits)	21,000	21,000	42,000
Operating Expense	***Subtotals***	**30,100**	**4,300**	**34,400**
603107	Computer Maintenance			0
603111	Dues & Subscriptions	500		500
603119	Memberships			0
603121	Moving Expense			0
603122	Multi-Media Services			0
603123	Non-Capitalized Computer Equipment	3,500		3,500
603124	Non-Capitalized Equipment	12,000		12,000
603126	Office Supplies	1,500		1,500
603127	Other Computer Services			0
603131	Postage	300	250	550
603132	Printing	400	250	650
603139	Software Non-Capitalized			0
603141	Software Licenses	700		700
603145	Supplies & Miscellaneous Expenses	6,000		6,000
603146	Fuel Gasoline Expense	5,200	3,800	9,000
Travel	***Subtotals***	**11,000**	**0**	**11,000**
603201	Travel In-State	6,000		6,000
603202	Travel Out-of-state	5,000		5,000
Contractual Services	***Subtotals***	**43,000**	**26,183**	**69,183**
603301	Consulting Services			0
603302	Equipment Rental/Lease Agreements	18,000		18,000
603304	Interagency Agreements			0
603305	Intra-Agency Agreements (CSU Stanislaus)		26,183	26,183
603310	Contractual Services-Other	25,000		25,000
Equipment	***Subtotals***	**0**	**0**	**0**
603401	Equipment Over $5,000/item			0
603403	Computer Equipment Over $5,000/item			0
Telephone Charges	***Subtotals***	**1,300**	**917**	**2,217**
603501	Cell Phone	650	650	1,300
603504	Telephone Moves/Adds/Changes	250		250
603505	Telephone Usage	400	267	667
Indirect Charges	***Subtotals***	**0**	**18,000**	**18,000**
	TOTALS	**$162,000**	**$120,000**	**$282,000**

Project 07-8-002-11 **Food Processing By-Products Land Application: *The Stanislaus County Model*** ***FY2007-08 Last Updated 03-07-07***		
Account Codes	Description	Stanislaus County/Industry Funding
Salaries, Wages, and Benefits	***Subtotals***	**66,600**
601202	Part Time Faculty	
601301	Management & Supervisory	
601401	Regular Staff	45,600
601701	Faculty Release	
601701	Additional Employment (Summer Salary)	
601701	Temporary Help	
601801	Student Assistant	0
601802	Bridge Student Assistant	
601910	Personal Service Reserve (Benefits)	21,000
Operating Expense	***Subtotals***	**3,148**
603107	Computer Maintenance	
603111	Dues & Subscriptions	300
603119	Memberships	
603121	Moving Expense	
603122	Multi-Media Services	
603123	Non-Capitalized Computer Equipment	
603124	Non-Capitalized Equipment	
603126	Office Supplies	
603127	Other Computer Services	
603131	Postage	250
603132	Printing	250
603139	Software Non-Capitalized	
603141	Software Licenses	
603145	Supplies & Miscellaneous Expenses	2,348
603146	Fuel Gasoline Expense	0
Travel	***Subtotals***	**7,500**
603201	Travel In-State	6,000
603202	Travel Out-of-state	1,500
Contractual Services	***Subtotals***	**26,183**
603301	Consulting Services	
603302	Equipment Rental/Lease Agreements	
603304	Interagency Agreements	
603305	Intra-Agency Agreements (CSU Stanislaus)	26,183
603310	Contractual Services-Other	
Equipment	***Subtotals***	**0**
603401	Equipment Over $5,000/item	
603403	Computer Equipment Over $5,000/item	
Telephone Charges	***Subtotals***	**917**
603501	Cell Phone	650
603504	Telephone Moves/Adds/Changes	
603505	Telephone Usage	267
Indirect Charges	***Subtotals***	**15,652**
	TOTALS	**$120,000**

AUDITOR-CONTROLLER
BUDGET JOURNAL

Balance Type	Budget
Category	Budget - Upload
Source	
Currency	USD
Budget Name	LEGAL BUDGET
Batch Name	BO#
Journal Name	ER FCG
Journal description	
Period	Dec-07
Organization	Stanislaus Budget Org

Line	Coding Structure						Debit	Credit	Description
	Fund 4	Org 7	Account 5	G/L Proj 7	Loc 6	Misc 6	incr appropriations decr est revenue	decr appropriations incr est revenue	
1	1001	34110	65660			.0		46,705.56	Special Dept. Exp
2	1001	34110	85850			.0	46,705.56		Operating Transfers Out
3	1011	34225	46600			.0		46,705.56	Operating Transfers In
4	1011	34225	63280			.0	50,000.00		Contracts
5						.0			
6						.0			
7						.0			
8						.0			
9						.0			
10						.0			
11						.0			
12						.0			
13						.0			
14						.0			
15						.0			
16						.0			
17						.0			
18						.0			
19						.0			
20						.0			
21						.0			
22						.0			
23						.0			
24						.0			
25						.0			
						Totals	96,705.56	93,411.12	

Explanation Transfer appropriations between funds and increase anticipated revenue and appropriations in Fund 1011.

Requesting Department	CEO		Auditors Office Only	
Signature	Signature		Prepared By	Admin Approval ($75K+)
Date	12/13/07 Date		Date	12-13-07 Date

Contact Person & Phone Number

Currency: USD
Fund=1001 (ER Environmental Resources)

Account	YTD Legal Budget	MTD Actual Expenditures	YTD Actual Expenditures	Encumbrances Outstanding	YTD Expend + Enc as % of Budget	Unencumbered/ Unexpended Bala
63990 Outside dp services	25,000.00	0.00	0.00	0.00	0.00	25,000.00
65000 Publications & legal notices	12,000.00	392.55	18,158.57	0.00	151.32	(6,158.57)
65100 Rents & leases-equipment	7,745.50	497.23	3,816.44	10,717.60	187.64	(6,788.54)
65300 Rents & leases-struct & grnds	2,000.00	157.70	630.80	0.00	31.54	1,369.20
65660 Special departmental expense	284,942.43	6,145.75	38,544.72	268,867.75	107.89	(22,470.04)
65780 Education & training	11,216.00	86.50	5,122.19	0.00	45.67	6,093.81
66040 Hazardous waste disposal	200.00	0.00	0.00	0.00	0.00	200.00
66050 Property debris cleanup	80,725.00	7,610.04	14,702.18	20,875.00	44.07	45,147.82
66190 Tuitions	0.00	990.00	2,970.00	0.00	n/m	(2,970.00)
66210 Licenses & fees	3,000.00	0.00	0.00	0.00	0.00	3,000.00
66260 Gasoline,oil & fuel-vehicle	42,549.80	1,483.09	10,595.18	26,924.82	88.18	5,029.80
67040 Other travel expenses	30,000.00	4,241.42	17,965.25	0.00	59.88	12,034.75
67200 Utilities	39,323.24	1.99	9.95	16,690.18	42.47	22,623.11
67990 Pre-Placement Drug Test	1,500.00	360.00	575.00	0.00	38.33	925.00
Services & Supplies	1,029,534.17	41,454.44	257,767.81	594,466.18	82.78	177,300.18
73510 Govt Fund Bill-Grand Jry Audi	1,260.00	91.00	455.00	0.00	36.11	805.00
73511 Govt Fund Bill-Auditor's Dept	54,920.00	9,154.00	22,885.00	0.00	41.67	32,035.00
73512 Govt Fund Bill-Purch Agent	11,150.00	953.00	3,740.00	0.00	33.54	7,410.00
73514 Govt Fund Bill-Risk Managemen	17,330.00	1,165.00	4,896.00	0.00	28.25	12,434.00
73516 Govt Fund Bill-BM Maint Srvcs	13,320.00	758.99	3,692.76	0.00	27.72	9,627.24
73517 Govt Fund Bill-BM Srvcs & Sup	8,940.00	2,047.07	4,100.16	0.00	45.86	4,839.84
73520 Govt fund A-87 charges-CEO	70,250.00	8,158.26	16,175.79	0.00	23.03	54,074.21
73521 Govt fund -A-87 carry forward	20,359.00	1,702.00	8,499.00	0.00	41.75	11,860.00
73530 Govt fund collection services	22,000.00	4,456.04	6,739.80	0.00	30.64	15,260.20
73540 Govt fund county counsel serv	105,570.00	5,101.08	31,492.08	0.00	29.83	74,077.92
73550 Govt fund utilities	37,210.00	2,815.11	12,084.27	0.00	32.48	25,125.73
73560 Govt fund contract janitorial	17,990.00	1,438.11	4,314.33	0.00	23.98	13,675.67
73660 Govt fund fingerprint process	0.00	55.00	115.00	0.00	n/m	(115.00)
74011 Telecommunications	26,670.00	2,354.06	11,875.18	0.00	44.53	14,794.82
74050 Auto liability	11,680.00	973.00	4,869.00	0.00	41.69	6,811.00
74060 Self insured general liabilit	19,890.00	908.00	4,534.00	0.00	22.80	15,356.00
74080 Central services printing	6,390.00	1,178.91	2,447.90	0.00	38.31	3,942.10
74090 Quick copy services	2,900.00	0.00	0.00	0.00	0.00	2,900.00
74100 Mail room postage meter	18,760.00	1,028.88	6,691.43	0.00	35.67	12,068.57
74102 Presort Postage	2,000.00	0.00	1.66	0.00	0.08	1,998.34
74110 Mail room services	2,400.00	279.92	677.35	0.00	28.22	1,722.65
74120 Messenger services	2,630.00	255.66	879.36	0.00	33.44	1,750.64
74123 Salvage Disposal	450.00	58.09	290.91	0.00	64.65	159.09
74130 Data processing services	65,420.00	5,521.47	27,592.32	0.00	42.18	37,827.68
74132 Peoplesoft implementation co	5,990.00	499.00	2,497.00	0.00	41.69	3,493.00
74160 Non-morgan shop vehicles	5,130.00	716.14	3,806.26	0.00	74.20	1,323.74
74162 Morgan Shop Fuel	13,220.00	795.27	5,527.97	0.00	41.82	7,692.03
74171 Fleet Svc - Depreciation	5,500.00	773.74	1,547.48	0.00	28.14	3,952.52

Attachment B - Itemized Budget

Project 07-8-002-11
Food Processing By-Products Land Application: *The Stanislaus County Model*
FY2007-08 Last Updated 03-07-07

Account Codes	Description	Stanislaus County/Industry Funding
Salaries, Wages, and Benefits	***Subtotals***	**66,600**
601202	Part Time Faculty	
601301	Management & Supervisory	
601401	Regular Staff	45,600
601701	Faculty Release	
601701	Additional Employment (Summer Salary)	
601701	Temporary Help	
601801	Student Assistant	0
601802	Bridge Student Assistant	
601910	Personal Service Reserve (Benefits)	21,000
Operating Expense	***Subtotals***	**3,148**
603107	Computer Maintenance	
603111	Dues & Subscriptions	300
603119	Memberships	
603121	Moving Expense	
603122	Multi-Media Services	
603123	Non-Capitalized Computer Equipment	
603124	Non-Capitalized Equipment	
603126	Office Supplies	
603127	Other Computer Services	
603131	Postage	250
603132	Printing	250
603139	Software Non-Capitalized	
603141	Software Licenses	
603145	Supplies & Miscellaneous Expenses	2,348
603146	Fuel Gasoline Expense	0
Travel	***Subtotals***	**7,500**
603201	Travel In-State	6,000
603202	Travel Out-of-state	1,500
Contractual Services	***Subtotals***	**26,183**
603301	Consulting Services	
603302	Equipment Rental/Lease Agreements	
603304	Interagency Agreements	
603305	Intra-Agency Agreements (CSU Stanislaus)	26,183
603310	Contractual Services-Other	
Equipment	***Subtotals***	**0**
603401	Equipment Over $5,000/item	
603403	Computer Equipment Over $5,000/item	
Telephone Charges	***Subtotals***	**917**
603501	Cell Phone	650
603504	Telephone Moves/Adds/Changes	
603505	Telephone Usage	267
Indirect Charges	***Subtotals***	**15,652**
	TOTALS	**$120,000**

ATTACHMENT A - Scope of Work

Stanislaus County
Striving to be the Best

DEPARTMENT OF ENVIRONMENTAL RESOURCES
3800 Cornucopia Way, Suite C, Modesto, CA 95358-9494

APPROVED WORK PLAN ON LAND APPLICATION OF FOOD PROCESSING BY-PRODUCTS

Presented to:

Pamela Creedon, Executive Officer
Regional Water Quality Control Board
Central Valley Region

Date: September 29, 2006

Stanislaus County's Work Plan on Land Applications of Food Processing By-Products

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Funding: Total committed funding from August 1, 2006 to July 31, 2008 is $282,000. The detail as follows:

Stanislaus County Board of Supervisors	$60,000
Industry Tipping Fees (Collected by Stanislaus County)	$60,000
Agricultural Research Initiative by CA Specialty Crop Grant	$162,000
Total	**$282,000**

Background

Program History

Stanislaus County has been active in researching, implementing and developing solutions for the use of food processing by-products in the agricultural community. In 1978, Stanislaus County recognized the potential problems of handling, transporting and using food processing by-products, and in concert with interested parties has developed a program that would address concerns and solved problems related to the handling and re-use of food processing by-products. The collaborating parties includes: the agricultural community including the Farm Bureau, UC Cooperative Extension and the Ag Commissioner's office, the Food Processing Industry, the by-product hauling companies, and the Department of Environmental Resources (DER). The goal of this team has been to develop a program that would address concerns and solve problems related to the handling and use of food processing by-products. This collaboration resulted in a unique self-supporting program for the operation and oversight of food processing by-product use sites in Stanislaus County.

The Stanislaus County Food Processing By-Product Use Program (the Program) has a long history of providing beneficial uses for by-products once regarded as problematic. Since 1987, over 6,000,000 tons of by-products have been land-applied as a soil amendment to farmlands, fed to cattle, or dried and processed for other beneficial applications. Additionally, the California Integrated Waste Management Board, which oversees the mandate for all California jurisdictions to reduce the amount of solid waste disposal in landfills, is of the opinion that had this material been land filled, rather than diverted to beneficial uses, Stanislaus County may not be in compliance with the mandated landfill diversion requirements of AB939.

The position of the department has consistently been that the Program held the potential for use by other California jurisdictions to operate similar beneficial-use programs in partnership with their communities. In fact, the County's interpretation of the initial contact by the RWQCB was that they had an interest in providing information about the Program to other jurisdictions that needed a workable solution to common issues regarding the reuse of food processing by-products.

The department and RWQCB had discussions about the Program in the hope that the department would be able to continue to operate the Program without crippling demands on the limited resources of the RWQCB. Based in part on the department's

opinion that these operations do not pose a threat to groundwater quality, staff requested a waiver of Reports of Waste Discharge (RWD) and Waste Discharge Requirements (WDR) for the beneficial use sites.

In a letter to the RWQCB dated February 15, 2006, the DER recommended that a task force should be formed to develop statewide guidelines for the handling of food processing by-products. This task force should include appropriate expertise and stakeholder representation in order to develop a program that would meet the concerns of all interested parties and may be applicable statewide.

On March 17, 2006, DER staff presented an overview of Stanislaus County's food processing by-products program to the RWQCB. As a result of the presentation and additional comments from the public, the Regional Board directed its staff to work with department staff to develop an alternative to the earlier draft waivers. DER staff met with the Executive Officer of the Regional Board to discuss outstanding issues and possible solutions. As a result of these meetings, the RWQCB issued a Tentative Resolution regarding the reuse of food processing by-products within Stanislaus County. This Tentative Resolution is significantly different from the two draft waivers proposed by the RWQCB.

The Tentative Resolution suspends any requirement for groundwater testing until the completion of the Research Project. This Research Project allows for the by-product characterization based on historical data and widely accepted best practices, as opposed to sampling each product delivered to the reuse sites. The waivers proposed earlier incorporated both groundwater monitoring and sampling and testing of all by-products.

On May 22, 2006, DER staff submitted comments on the Tentative Resolution. After the closing date, staff contacted the RWQCB to inquire if any additional comments were submitted in regards to the Tentative Resolution. There were several submissions in support of the department's comments to the resolution, and only one in opposition of the resolution. The Tentative Resolution was considered and adopted by the RWQCB on June 22.

On June 13, 2006, the Stanislaus County Board of Supervisors authorized $30,000 for fiscal year 2006/07 and again in fiscal year 2007/08, and directed that the $60,000 funding be placed in a special account for use on the Food Processing By-Products Research Project. A public hearing was held on August 15, 2006, where the Board of Supervisors considered and adopted a $0.10 per ton fee at each permitted site for research funding. The fee will generate an estimated revenue of $25,000.00 to $30,000.00 per year during the two fiscal years. Additional research projects may be included in this research project, if additional funding can be secured.

Program Requirements

The Stanislaus County Department of Environmental Resources has implemented the program requirements as specified in the California Regional Water Quality Control Board Central Valley Region Resolution No. R5-2006-0052 (Attachment A, May 2006).

This resolution describes the requirements that the Stanislaus County's Food Processing By-Products Use Program, (May 2006), is to complete in 2007, including specific soil and by-product testing.

In addition, the Del Monte Foods Company will be sampling approximately 30 loads of its by-product before it leaves Del Monte Foods Plant 1. The purpose of this sampling is to gather additional product specific samples during this processing season. The sampling protocol, Attachment B, was provided by Tim Ruby, Environmental Water Manager, Del Monte Inc.

Work Plan Objectives

Introduction

This work plan has been developed based on the RWQCB Resolution No. R5-2006-0052 and the memorandum addressed to Jack Del Conte, Assistant Executive Officer, from Wendy Wyels, Environmental Program Manager dated August 16, 2006. The purpose of the work plan is to address the Regional Board staff's concerns regarding the prevention of water quality impacts as specified in Finding 9. a. of the Resolution. As stated in the Resolution, Regional Board staff has determined that for land application sites, Stanislaus County's program is adequate as currently implemented for the prevention of nuisance conditions and impacts to surface water. Therefore, this work plan will not address the prevention of the nuisance conditions and the prevention of impacts to surface water.

Goals of the Work Plan

The goal of this work plan is to address the concerns specified in the RWQCB resolution R5-2006-0052 through a collaborative effort between the Principal Investigators, Co-Principal Investigators, Collaborators and Cooperators (Research Team) all of whom are listed in the first three pages of the work plan. The introductory meeting was held on August 17, 2006 and the group agreed to meet quarterly on the second Thursday of the months of November 2006, February 2007 and May 2007. The goals of this group are as follows:

1. Conduct a literature review that adequately addresses the RWQCB concerns listed in Resolution R-52006-0052 Finding 9.a and identify potential alternative management methods.
2. By January 1, 2007, the Research Team will provide the RWQCB with a written report of the literature review, organized to specifically address each of the concerns listed on Finding 9.a. Also included in this written report will be recommendations supported by quantitative information, potential alternative management options identified, as well as the Research Team identification of data gaps.
3. Using the information gathered in the literature review the Research Team will perform a technical review of Stanislaus County's Program along with locally generated land application data.

4. By April 1, 2007, the Research Team will provide to the RWQCB a written report of the results of the technical review of the program and the locally generated data for land application sites from years 2000 through 2006. This report will specifically address any deficiencies in the County's Program as they relate to the Finding 9.a.
5. Stanislaus County Office of County Council will review the legal authority of implementing and enforcing the County Program. County Council will draft an ordinance or other legal mechanism to recommend to the Stanislaus County Board of Supervisors for adoption prior to January 1, 2008.
6. The Research Team will develop a Manual of Best Practices for the Land Application of Food Processing By-Products in Stanislaus County (MBP). The MBP will include management methods, waste prevention, potential alternative management methods to land application, and waste minimization actions that will minimize potential soil and water and quality impacts at by product land application sites. Including but not limited to: (a) a reduction of the salinity and water content of the food processing by-products applied to land and (b) an increase in pH of the food processing by-products applied to land. The MBP will be include two sections, the first for use by Stanislaus County for permitting purposes and the second section for use by the operator of the land application sites.
7. By July 1, 2007, the Research Team will submit a final report to the Executive Officer. This final report shall include the results of the Literature Review, Technical Review, Legal Assessment and proposed ordinance changes and the MBP. In addition, the final report will include potential alternative management opportunities and proposed changes, if needed, to Stanislaus County's Program to protect soil and groundwater quality.

Work Plan Objectives

The objectives that will be completed under this work plan include:

1. Conduct a review of technical literature.
2. Determine the percentage of total dissolved solids (TDS) in food processing by-products commonly produced in California food processing plants that is present as volatile dissolved solids (VDS), and how much of this VDS will degrade within the soil profile.
3. Evaluate the actual or potential impacts to groundwater of food processing by-products with high moisture content that is applied to land prior to the planting of crops.
4. Evaluate the actual or potential impacts to groundwater caused due to on-site storage of food processing by-products during rain events.
5. Evaluate and determine the actual or potential water quality impacts that (a) high strength (salinity and BOD) and (b) low pH food processing by-products may have in land application practices.
6. Design an environmental and by-product monitoring program with consideration for site and by-product characteristics and conditions.

7. Develop proper controls, management measures and prohibitions (given site and waste characteristics and conditions) to address these types of food processing by-products applied to land.
8. Develop proper controls, management measures and prohibition given site and by-product characteristics to ensure storage of food processing by-products is done in a manner that is protective of groundwater quality.
9. Identify site and waste characteristics and conditions that would prohibit the application of food processing by-products to land.
10. Establish requirements that prohibit the discharge of liquid wastes to land under the County's Program.
11. The Research Team, through Stanislaus County, shall submit quarterly progress reports suitable for inclusion in the Executive Officer's report section of the Regional Board agenda (due September 30,2006, December 30, 2006 and March 30, 2007). These reports will be prepared in the form of Executive Summaries, with a desired length of less than two pages.
12. The Research Team, through Stanislaus County will schedule meetings as necessary with the Executive Officer and/or RWQCB staff. At a minimum these meetings shall be scheduled at least quarterly on November 9, 2006, February 8, 2007 and May 8, 2007 at 1:00 p.m. The Research Team will make a 30-minute presentation of results obtained to date, followed by a 2-hour session of discussion.
13. Identify potential alternate management options for food processing by-products, including, but not limited to: energy generating technologies (centralized and onsite), animal feed (increased on-farm programs and feed manufacture), fertilizer manufacture, and increased supply for composting.

The information and findings from the County's Program Requirements, additional product sampling (Del Monte Foods), and the results of the revised Work Plan (Literature Review, Technical Review of the Stanislaus County Program, Legal Assessment of Stanislaus County Program) will aid in the development of a Stanislaus County ordinance and the development of MBP . This MBP maybe used in other counties through out the State of California.

Literature Review

Introduction

The application of food processing by-products to agricultural farmlands, while certainly not new, has become increasingly widespread. This practice is important not only for the recycling nutrients back to the soil, and into crops, but also for minimizing nitrogen and phosphorous pollution from by-product that would otherwise be concentrated elsewhere. The food processing industries in California are the leading U.S. producers of processed fruits and vegetables such as tomatoes, olives, peaches, and etc (Reed, 2006). As expected, due to the variety of fruits and vegetables that are processed and the substances involved food processing by-products vary as well. Food processing by-products are referred to as slurry, semi-solid, or solid waste produced from canneries.

The influence of their applications on farmlands can vary by their constituents as well as biotic and abiotic factors. An expansion of land-applied organic wastes is projected to rise because of the public concerns regarding environmental impacts and economic restraints of their disposal to landfill or incineration (O'Connor et al., 2005) and because of presumed inherent agricultural benefits. This literature review will explore available scientific information on the potential effects of food processing by-products applied on farmlands.

Goals of the Literature Review

The goal of the literature review is to address the concerns specified in the RWQCB resolution R5-2006-0052. Specifically, the Research Team will:

1. Complete a literature review that adequately addresses the RWQCB concerns listed in Resolution R5-2006-0052 Finding 9.a.
2. By January 1, 2007, provide the Regional Board a written report of the literature review; organized to specifically address each of the concerns listed Finding 9.a. Also included in this written report will be recommendations supported by quantitative information, as well as identification of data gaps.
3. Using the information gathered in the literature review the Research Team will review the locally generated land application data, and provide a technical review of Stanislaus County's Program.

Objectives of the Literature Review

The objectives of this work plan are as follows:

1. Search selected databases and journals for applied scientific information or data to adequately address the RWQCB concerns listed in Resolution R5-2006-0052 Finding 9.a. Specific databases and journals are listed in the Literature Review Sources section.
2. Search on the Internet for food processing by-products programs by other public agencies.
3. Design an environmental and by-product monitoring program with consideration for site and by-product characteristics and conditions.
4. Search for information to evaluate and determine the actual or potential water quality impacts that (a) high strength (salinity and BOD) and (b) low pH food processing by-products may have in land application practices.
5. Search for information or data to determine if there are published analyses on the percentage of total dissolved solids (TDS) in food processing by-products that is present as volatile dissolved solids (VDS), and how much of this VDS will degrade within the soil profile.
6. Evaluate the results of the literature review to determine if there are actual or potential impacts to groundwater due to food processing by-products with high moisture content that is applied to land prior to the planting of crops.
7. Evaluate the results of the literature review to determine the actual or potential impacts to groundwater caused by on-site storage of food processing by-products during rain events.

8. Evaluate the results of the literature review to determine and make recommendations regarding the proper controls, management measures and prohibition of land application given site and waste characteristics to ensure storage of food processing by-products is protective of groundwater quality.
9. Evaluate the results of the literature review to identify site and waste characteristics and conditions that would prohibit the land application of food processing by-products.
10. By January 1, 2007, provide the Regional Board a written report of the literature review; organized to specifically address each of the concerns listed Finding 9.a. Also included in this written report will be recommendations supported by quantitative information, as well as identified gaps in the information that may require additional study.
11. Using the information gathered in the literature review the Research Team will review the locally generated data, and provide a technical review of Stanislaus County's Program.
12. Search for information regarding potential alternative management methods for food processing by-products.
13. Evaluate the results of the literature review to determine which potential alternative management methods may be more environmentally sound, a higher end use of materials, and/or economically feasible.

The information, results and findings from the literature review will aid in the technical review of the County Program as well as the review of the locally generated land application data. This evaluation will aid the development of Stanislaus County ordinance and enforcement of the County Program and the development of MBP.

Literature Review Sources

The following databases will be used as basic search engines. Each database covers a large number of scientific journals extensively used among research scientists and environmentalists to address their research questions. The databases will include, but not limited to:

a) AGRICOLA;
b) BIOSIS Preview and Biological Abstracts;
c) ScienceDirect;
d) ArticleFirst www.rdg.ac.uk/ligrary/resources/articlefirst.html;
e) Food and Agriculture Organization of the United Nations (FAO) World Agricultural Information Centre (WAICENT) Information Finder www.fao.org/waicent; and
f) IngentaConnect www.ingentaconnect.com.

For example, these databases compile research from the-Journal of Environmental Quality, Soil Science Society of America Journal, and Journal of Soil Science. In addition, to address areas of hydrological science in relation to groundwater monitoring the following journals will be searched:

a) Vadose Zone Journal;
b) Journal of Contaminant Hydrology;
c) Ground Water;
d) Water Resources Research;
e) Journal of Geotechnical and Geoenvironmental Engineering;
f) ASCE's Journal of Environmental Engineering http://scitation.aip.org/eeo;
g) Water Environment Research published by Water Environment Federation www.wef.org/ScienceTechnologyResources/Publications/WER;
h) Journal of Environmental Quality http://jeq.scijournals.org;
i) http://www.asa-cssa-sssa.org/publications/pdf/catalog.pdf; and
j) http:www.asabe.org/pubs/PubCat02/waste.html.

The following keywords or terms will be used to perform database searches including but not limited to:

- 'food processing waste' insofar as it refers to by-products from the processing of vegetables and fruit;
- 'raw material' or 'residue' insofar as it refers to vegetables and fruits;
- 'low pH' as it refers to food processing by-products/wastes on alkaline soil;
- 'VDS', 'TDS', and 'metals' insofar as it refers to the fate in soils and groundwater;
- 'water holding capacity' insofar as it refers to various soil types or soil textures, and Stanislaus County soils;
- 'leaching factor' or 'leaching potential' insofar as it refers to various soil types or soil textures, and Stanislaus County soils;
- 'vadose zone';
- 'carbon sequestration'
- 'carbon cycling'
- 'nutrient cycling'
- 'hydrology' and/or 'contaminant hydrology'; and
- 'soil moisture' and/or 'moisture transport' and/or 'water flow' and/or 'mass transport' and/or 'wetting front' and/or 'hydraulic diffusivity';
- 'groundwater impact';
- 'BOD load' or 'BOD loading';
- Searches for potential alternative management methods for food processing by-products will be done through organizations, including but not limited to the California Integrated Waste Management Board, the California Department of Food and Agriculture, the California Energy Commission, the California Association of Sanitation Agencies, the Stanislaus County Agricultural Commissioner, the California Biomass Collaborative, the California Grain and Feed Association, and the Pacific Coast Renderers Association.

In addition, we will review other sources of information, e.g., unpublished reports from the following sources:

a) Annual reports submitted by food processors and by permitted sites;
b) 'Research report of liquid and solid food processing waste management research' by Pacific Coast Producer and CSU Chico;

c) 'Guidelines for land application of non-traditional organic wastes (food processing by-products and municipal yard wastes) on farmland in New Jersey;
d) 'Environmental self-assessment for the food processing industry: a quick and easy checklist for pollution prevention measures for the food processing industry' New York;
e) 'The Food Processing Residual Management Manual' by Pennsylvania Department of Environmental Protection;
f) 'General Permit Authorization to Land Apply Wastes Generated from Food and Beverage Processing Facilities' by State of Minnesota, Pollution Control Agency, Regional Environmental Management Division;
g) Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater, by Idaho Department of Environmental Quality: and
h) 'Food processing sector environmental compliance assistance tool' for State of Washington (http://www.envcap.org/fpst/fps2001.cfm?st=WA): And
i) California League of Food Processors Official Website (http://www.clfp.com), etc.

In addition, we will review the following compendia:

a) Land Application of Agricultural, Industrial, and Municipal By-Products J.F. Powers and W.P. Dick, ed. Hardcover, 653pages, 2000; SSSA Book Ser. 6. ISBN: 0-89118-834-7. Item Number B60901.;
b) Animal, Agricultural and Food Processing Wastes. 767 pages, 2000, 6X9 inches, softbound. ISBN: 1-892769-11-5. Order No. P0002; and
c) Seventh International Symposium on Agricultural & Food Processing Wastes. 636 pages,1995, 6X9 inches, softbound. ISBN: 0-929355-66-0 Order No. P0795.

The results of this literature review will be summarized in an annotated bibliography, which will include the full reference to the source, as well as a few words summarizing the key findings. When appropriate, a key figure or table may be included. The research Team will compile a binder with hard copies of the references.

Additional Tasks to Address Finding 9.a.

Should the results Literature Review not adequately address the RWQCB Finding 9.a. the Research Team proposes the following tasks as the next steps. However, it is not clear at this time if the existing funding is adequate to complete all of the tasks listed below:

1. Determine the percentage of TDS in food processing by-products that is present as VDS, and how much of this VDS will degrade within the soil profile.

   To complete this task, the Research Team will:
   a. Use existing data from the literature.
   b. Sample and analyze 20 representative samples of by-products. The samples will be converted into a slurry with their own moisture, and the filtrate from this slurry will be analyzed for TDS, VDS, and pH.

c. Sample and analyze soils at three different locations at the two land application sites. For each of the six locations, samples will be collected at depths of 3, 6, 12, and 24 inches. The samples will be converted into a slurry with deionized water and the filtrate from this slurry will be analyzed for TDS, VDS and pH.

2. Evaluate the actual or potential impacts to groundwater of food processing by-products with high moisture content that is applied to land prior to the planting of crops.

   To complete this task, the Research Team will:

   a. Use existing design programs (e.g., HELP or LEACHW) to estimate the amount of water that may infiltrate through the vadose zone into the soil profile.
   b. Install soil moisture probes at three locations with the land application sites. The soil probes measure the dielectric constant of the soil, from which soil moisture and migration of moisture fronts can be calculated; a data logger continuously records data. Visit http://www.ech2o.com/echosystem.htm for a description of the system. Each site will have soil probes installed at depths of 6, 12, 24, and 36 inches. The data collected will be correlated to natural precipitation events recorded at the onsite SIMI station, and to irrigation events documented by the ranch manager.
   c. Conduct infiltration experiments, to determine rate of infiltration as a function of initial "depth" of application, and as a function of time (in turn a function of degree of saturation). Ten infiltration experiments will be performed using plastic double-ring infiltrometers, and tomato juice as the infiltrating liquid (color and saltiness will help to identify the infiltration front after the infiltrometers are excavated). The field experiments will include resistivity measurements to see if a simple geophysical technique can be used for fast determination of depth of infiltration, and post-experiment excavation of the infiltrometers for inspection of the moisture front and collection of soil samples.

3. Evaluate the actual or potential impacts to groundwater caused by on-site storage of food processing by-products during rain events.

   To complete this task, the Research Team will:

   a. Take in consideration the results of the previous task.
   b. Use existing design programs (e.g., LEACHM) to estimate the amount of water that may infiltrate through the vadose zone into the soil profile. This is an extension of Task 3, with the difference that mass transport is taken into account, as well as considerably high precipitation events

4. Evaluate and determine the actual or potential water quality impacts that (a) high strength and (b) low pH food processing by-products may have in land application practices.

   To complete this task, the Research Team will:

   a. Use existing design programs (e.g., LEACHM) to estimate the amount of water that may infiltrate through the vadose zone into the soil profile. This is an extension of Task 4, with the difference that mass transport is evaluated for high-strength concentrations.
   b. Evaluate the known geochemistry of two species of concern (arsenic and chromium), to see if changes in the pH of the soil are likely to mobilize these elements from the soil into infiltrating waters

5. Determine an adequate monitoring program for the by-products, soil and groundwater, considering site and by-product characteristics and conditions.

   To complete this task, the Research Team will:

   a. Use the results of the previous tasks to characterize the statistical variability of chemical parameters in by-products, soils, and groundwater. If the statistical variability is known, an adequate monitoring program can be designed.

6. Develop proper controls, management measures and prohibitions (given site and waste characteristics and conditions) to address these types of food processing by-products applied to land.

   To complete this task, the Research Team will:

   a. Use the results of the previous tasks to characterize the statistical variability of chemical parameters in by-products, soils, and groundwater. One the statistical variability is known, an adequate monitoring program can be designed.
   b. Use existing design programs (e.g., HELP or LEACHW) to evaluate "scenarios" for different waste characteristics and site conditions.

7. Develop proper controls, management measures and prohibition given site and waste characteristics to ensure storage of food processing by-products is done in a manner that is protective of groundwater quality.

   To complete this task, the Research Team will:

a. Use the results of the previous tasks to establish different management categories (based on waste characteristics, site conditions, precipitation events, and application frequency and intensity).
b. Use the experience of Stanislaus County, and of the land application operators, to develop a management plan.

8. Identify site and waste characteristics and conditions that would prohibit the application of food processing by-products to land.

   To complete this task, the Research Team will:

   a. Use existing design programs (e.g., HELP, LEACHW, or LEACHM) to evaluate "scenarios" for different waste characteristics and site conditions.
   b. Determine "threshold" conditions that would make the land application of by-products unadvisable (e.g., mass transport rates larger than decay rates of organic contaminants, loading larger than soil adsorption capacity, or breakthrough of more than 10% of precipitation).

9. Establish requirements that prohibit the discharge of liquid wastes to land under the County's Program.

   To complete this task, the Research Team will:

   a. Draft an advisory to Stanislaus County, with proposed restrictions on the discharge of liquid wastes to land under the County's Program.

If it is necessary to complete any or all of the tasks listed above the results of this information will be included in the technical review of the locally generated data. The final results from these tasks will be included in the Final Report submitted to the Executive Director of the RWQCB.

Technical Review of the Stanislaus County Program

Introduction

Stanislaus County has been regulating the land application of food processing by-products to farmland since 1987. In 2005, almost fifty percent of the food processing by-products was fed directly to livestock. The program has regulated an average 300,000 tons annually. The focus of this technical review will be on the land application of food processing by-products and the actual or potential impact that land application may have on soil and groundwater quality. Staff of the RWQCB has determined that the Stanislaus County Program does adequately protect the potential impact to surface waters.

The Research Team will review the Stanislaus County Food Processing By-Products Use Program requirements, Resolution R5-2006-0052 including the Agreement for Monitoring and Reporting of Solid and Semi-Solid Food Processing By-Products Applied Under the Stanislaus County Program, locally produced land application data,

the results of product sampling, the results of the soil sampling and compare them to the results of the literature review and information found through a literature review process.

Goals of the Technical Review

The goal of this Technical Review is to address the concerns specified in the RWQCB resolution R5-2006-0052 through a collaborative effort of the Research Team. . The goals of this group are to provide the following:

1. A Technical Review of the County Program that adequately addresses the RWQCB concerns listed in Resolution R-52006-0052 Finding 9.a.
2. Using the results of the Literature Review (to be submitted by January 1, 2007) the Research Team will perform a Technical Review of the County Program and locally generated land application data collected during 2000 to 2006.
3. By April 1, 2007, provide a written report to the RWQCB on the results of the Technical Review of the County Program and the locally generated data collected during 2000 to 2006.

Objectives of the Technical Review

The Research Team will provide a written report to the RWQCB on the results of the Technical Review of the County Program and the locally generated data. The report will summarize the results of the previous tasks, and will include a technical review of the Stanislaus County Food Processing By-Products Use Program requirements and of Resolution R5-2006-0052 (including the Agreement for Monitoring and Reporting of Solid and Semi-Solid Food Processing By-Products Applied Under the Stanislaus County Program).

In addition, the Research Team will complete the following as a part of the Technical Review:

1. Assess the quantitative data found as the result of the literature review and compared those with data collected by the County Program. This will include but not limited to the following:
    a. Compare the specific site characteristics of site found in the literature review to land application sites in Stanislaus County.
    b. Analyze the results of the by-product concentration found in the literature compared to those by-products land applied in Stanislaus County.
2. Determine potential site's characteristics, i.e., soil texture, topography, etc that can be safely applied food processing by-products with the least detrimental impacts on soil and groundwater quality.
3. Categorize the food processing by-products based on their constituents of concerns and impose their applications of farmland under environmental-friendly approaches.

The report will conclude with a professional opinion as to whether the County Program adequately:

1. Provides an adequate monitoring program for the by-products, soil and groundwater, considering site and by-product characteristics and conditions.

2. Provides for the actual or potential water quality impacts that (a) high strength and (b) low pH food processing by-products may have in land application practices.
3. Establishes requirements that prohibit the discharge of liquid wastes to land under the County's Program.

The information, results and findings from the Technical Review will aid the legal assessment of Stanislaus County Program and development of the Stanislaus County ordinance. The results will also be used implementation and enforcement of the County Program as well as aiding in the development of the Manual of Best Practices.

Legal Assessment of Stanislaus County Program

On June 13, 2006, the Stanislaus County Board of Supervisors adopted a recommendation to support the adoption of the Regional Water Quality Control Board's tentative resolution regarding the reuse of food processing by-products. The requirements of the resolution were presented to the Board of Supervisors so it would understand the intent and responsibilities outlined in the tentative resolution.

Assistant County Counsel John P. Doering, will provide research of the legal authority of Stanislaus County Department of Environmental Resources ability to implement and enforce the Food Processing By-Products Program. In addition, John Doering will draft a local Ordinance or other legal mechanism for adoption by the Stanislaus County Board of Supervisors for the implementation and enforcement of the Food Processing By-Products Program.

Assistant County Counsel John P. Doering will complete the legal review by January of 2007, draft the local Ordinance or other legal mechanism by July of 2007 and will to the Board of Supervisors for proposed adoption by the Board no later than November of 2007.

Manual of Best Practices

Introduction

This research project was developed to research data and to address the findings in RWQCB Resolution No. R5-2006-0052 specifically Finding 9.a. The results of the Literature Review, Technical Review will be used to develop the best management practices manual for land application of food processing by-products on farmlands under Stanislaus County Food Processing By-Products Program.

Goals of the Manual of Best Practices

The Research Team is to develop a Manual of Best Practices that will address the concerns specified in the RWQCB resolution R5-2006-0052 either through scientific findings, limitations or management practices. The Manual of Best Practices for the

Land Application of Food Processing By-Products in Stanislaus (MBP) will be submitted to the RWQCB by July 1, 2007.

Objectives of the Manual of Best Practices

1. The manual will be written in two sections. The first section will be developed for Stanislaus County. It will be used in establishing the criteria for siting, permitting and regulating land application sites. The second section of the manual will be a field manual for operators describing decision making guidelines for management options of food processing by-products and the "How to" of land applying food processing by-products.

Upon completion of the scope of work outlined within this work plan the goal is to adopt a program that will minimize potential water quality impact after land application of the food processing by-products. To address the Regional Water Quality Control Board's resolution requirements, the following items are essential components to be considered in the MBP:

1. Implementation of an environmental and by-product monitoring program with consideration for site and by-product characteristics and conditions.
2. Evaluate and determine the actual or potential water quality impacts that the high strength and low pH food processing by-products may have in land application practices.
3. Develop proper controls, management measures, conditions and prohibitions (given site and by-product characteristics) to address these types of food processing by-products application to farmlands.
4. Determine the percentage of TDS in food processing by-products that is present as VDS, and how much of this VDS will degrade in the soil profile.
5. Evaluate the actual or potential impacts to groundwater of food processing with a high moisture content that is applied to land prior to planting crops.
6. Evaluate the actual or potential impacts to groundwater caused by on-site storage of food processing by-products during rain events. Develop proper controls, management measures, and prohibitions given site and waste characteristics to ensure storage of food processing by-products is done in a manner that is protective of groundwater quality.
7. Identify site and by-product characteristics and conditions that would prohibit the application of food processing by-products to land.
8. Establish requirements that prohibit the discharge of liquid wastes to land under the County's Program.
9. Methods to minimize food processing by-products and associated problematic characteristics, as well as decision making guidelines for selecting the best alternative management options available for managing food processing by-products.

Development of the Manual of Best Practices

The Research Team will use the results of the Literature Review, Technical Review in the development of the MBP. In addition, to determine site specific characteristics the following resources may be used: "Soil Survey of Stanislaus County, California, Western Part, United States Department of Agriculture, Soil Conservation Service" (Soil typed approved 1997), California USGS 7.5 minute quadrangle maps, Hydrogeologic Characterization of the Modesto, San Joaquin Valley California by K.R. Burow, J.L. Shelton, J.A. Hevesi, and G.S. Weissmann, 2004, U.S. Department of the Interior, U.S. Geological Survey. The first section one of the MBP will include but will not be limited to such items as:

1. Definitions of Food Processing By-Products
2. Permitting Process
3. Characteristics of Food Processing By-Products
4. Benefits of the Re-use of Food Processing By-Products
5. Sampling and Analyzing Food Processing By-Products
6. Siting land application sites
7. Site preparation and pre-application soil sampling
8. Site characteristics of land application site (such as soil profile, depth to groundwater and condition of soil.
9. Maximum Concentrations and Loading Rates
10. Field selection
11. Transportation of by-products
12. Methods of application of Food Processing By-Products,
13. Application rates
14. Crop Selection
15. Field Rotation
16. Site Monitoring and Inspection
17. Record keeping,
18. Odor control,
19. Storage considerations, and
20. Program performance review.

This second section, will be a "how to" field manual and will include but is not limited to the following:

1. Background Information on Food Processing By-Products Program
2. Benefits of the Re-use of Food Processing By-Products
3. Methods to Minimize Food Processing By-Products and Associated Problematic Characteristics
4. Potential Alternative management Options for food Processing By-Product
5. Permitting Process
6. Siting land application sites
7. Site preparation and pre-application soil sampling
8. Site characteristics of land application site (such as soil profile, depth to groundwater and condition of soil.

9. Sampling and Analyzing Food Processing By-Products
10.Maximum Concentrations and Loading Rates
11.. Field selection
12. Transportation of by-products
13. Methods of application of Food Processing By-Products,
14. Application rates
15. Crop Selection
16. Field Rotation
17. Site Monitoring and Inspection
18. Record keeping,
19. Odor control,
20. Storage considerations,
21.Program performance review.

This MBP will provide a detailed description of the land application program, and program requirements, and alternative management methods that will allow Stanislaus County and other jurisdictions in California to implement a food processing by-products land application program. This program is limited to the reuse of by-products in the forms of solid, semi-solid and slurry. In addition, to the implementation and education that must be followed to ensure that a nuisance is not created and there are adequate protections of both surface and groundwater as well as soil quality. The other purpose is to provide operators of land application a "how to" or "step by step" manual for a land application of food processing by-products.

Project Timeline

Major Activity (Areas/Objectives)	Performance Period
1) Preliminary results of the literature review *Deadline*	July 15 to July 31, 2006 *(August 1, 2006)*
2) Work Plan to RWQCB *Completed*	August 1, 2006
3) Revised Work Plan to RWQCB	August 31,2006
4) Quarterly Report to Executive Officer	September 30, 2006
5) Research Group Meeting	November 9, 2006
6) Quarterly Report to Executive Officer	December 30, 2006
7) Results of the literature review *Deadline-Literature Review to RWQCB*	July 15 to December 31, 2006 *(January 1, 2007)*
8) Research Group Meeting	February 8, 2007
9) Quarterly Report to Executive Officer	March 30, 2007
10) Technical Review of 2000-06 data *Deadline-Technical Review to RWQCB*	January 1 to March 31, 2007 *(April 1, 2007)*
11) Research Group Meeting	May 8, 2007
12) Final report due to the Executive Officer *Deadline-Final Report to RWQCB*	April 1 to June 30, 2007 *(July 1, 2007)*
13) Develop an ordinance and enforcement Program *Deadline-Proposed Adoption by Board of Supervisors*	July 1 to December 31, 2007 *No Later than January 1, 2008*

References

O'Connor, G.A., H.A. Elliott, N.T. BASTA, R.K. Bastian, G.M. Pierzynski, R.C. Sims, and J.E. Smith, Jr. 2005. Sustainable Land Application: An Overview. Environmental Quality 34:7-17.

Reed, M. 2006. California Horticultural Crops Statistical Information 2006 pp.4. Pestharvest Technology Research and Information Center, Davis California

DEL MONTE MODESTO, CA
FOOD PROCESSING BY-PRODUCTS
SAMPLING/TESTING PLAN

INTRODUCTION AND PURPOSE

This sampling/testing plan pertains to food processing by-products[1] generated at the Del Monte Modesto Plant #1which are land applied within Stanislaus County. At present, approximately 35,000 wet tons of plant by-products are hauled by truck to land application sites annually and subsequently spread and disked into the soil for growth of agronomic crops. These plant by-products are spread and disked at the land application sites in accordance with state and county permits/approvals.[2] Among other things, these permits/approvals require land-applied by-products to be routinely sampled/tested for major plant nutrients and to be land applied at agronomic loading rates. The following procedures will be followed in sampling and testing land applied plant by-products.

PLANT BY-PRODUCTS AND SAMPLING POINTS

There are two basic types of food processing by-products generated at the plant that will need to be sampled and tested for land recycling. The first type consists of peeling by-products collected and neutralized in a 17,000 gallon above ground storage tank at the plant. The second type consists of by-products screened from various water streams and collected in bins throughout the plant. The goal in sampling these by-products streams is to collect representative samples (i.e., composite and/or grab samples characteristic of recycled by-products).

By-Product Type	Sampling Point
Neutralized Peeling By-Products[3,4]	Collect from 17,000 gallon holding tank discharge pipe. Sample well mixed by-products pumped to hauling trucks.
Screenings and Other Miscellaneous By-Products	Collect multiple samples from by-products stockpiled at reuse site shortly before spreading and disking. Collect equal amounts/volumes of by-product samples throughout the stockpile and combine.[5]

[1] Peelings, skins, puree, etc., generated in the production of canned fruit products (peaches, pears, apricots, etc.).
[2] California Regional Water Quality Control Board Central Valley Region Resolution No. R5-2006-0052 and Stanislaus County February 2005 "Food Processing By-Products Use Program."
[3] pH of by-products adjusted to have a pH (Std. Units) greater than 5.0 but less than 12.0 (target 9.0) before being hauled and land applied.
[4] Tank equipped with mixer.
[5] Take four or more grab samples of equal volume, combine them, and then send the composite to a qualified laboratory for analysis.

SAMPLING FREQUENCY

In general, the more samples taken, the greater the chance that the sampling results will be representative of the by-products generated and land applied. From a statistical standpoint, 20 or more samples are typically required to fully define the variation from the average result or mean quality. In general, it is given that the greater the standard deviation, the greater the number of individual samples that should be taken to get a representative sample. Plant by-products will initially be sampled at the following frequencies to define average and range in quality.

By-Product Type	Sampling Frequency*
Neutralized Peeling By-Products	Twenty or More Samples** Spread-Out Across the Processing Season and Characteristic of all Raw Products Processed During the Pack Season
Screening and Other Miscellaneous By-Products	Twenty or More Samples*** Spread-Out Across the Processing Season and Characteristic of all Raw Products Processed During the Pack Season

*Testing frequency for some sampling/testing parameters may be reduced (e.g. metals) if there is not much variability (the standard deviation is not great) between/among sampling/testing results.
**Well mixed samples collected from 17,000 gallon by-products holding tank discharge piping.
***Composite samples (consisting of four or more grab samples) collected from by-products shortly before disking/land application.

SAMPLING EQUIPMENT

Sampling equipment (e.g., pails, shovels, pitchers, containers, etc.) must be made of materials that will not contaminate or react with the by-products. Suitable materials include glass, stainless steel and plastic (Telflon, polyethylene, and polypropylene). Any steel equipment used must not be galvanized or zinc coated because this will contaminate the sample. Moreover, all equipment should be thoroughly cleaned prior to the initiation of sampling activities each day (as well as between different samples to prevent cross contamination) as follows:

- Use a stiff brush to remove all visible particles.
- Wash with good quality laboratory detergent (Alconox or equivalent) and tap water.
- Double rinse with deionized, distilled water.
- Air-dry the equipment.

SAMPLE SIZE

Enough by-product should be sampled to fill a quart-sized laboratory supplied and cleaned sample bottle. Wide-mouthed plastic containers are recommended for sampling.

SAMPLE LABELING

Sample labels will be utilized to prevent misidentification of samples. Gummed paper labels will be utilized and include at least the following information.

- Sample ID
- Name of Collector
- Time and Date of Collection
- Place of Collection

The sample label will always be directly affixed to the sample container, and always be completed using indelible ink.

SAMPLE PRESERVATION

At the time of sampling, samples will be thoroughly mixed and be poured into sample containers supplied by a qualified laboratory.[6] While awaiting shipping, samples will be stored at a temperature of 4°C. Preserved samples will be packed on ice in high impact plastic coolers with lids upon collection and be shipped via overnight delivery to the testing laboratory and/or be hand delivered to the laboratory on day of collection. At the laboratory, samples will be tested within recommended holding times for required sampling/testing parameters.

CHAIN-OF-CUSTODY

A chain-of-custody will be completed for each sample to be shipped for laboratory testing. The original chain-of-custody will accompany the sample and a copy will be maintained in plant files.

TESTING PARAMETERS AND ANALYTICAL METHODS

By-product samples will be shipped to a qualified laboratory for testing. At the laboratory, samples will be tested pursuant to: Soil, Plant and Water Reference Methods for the Western Region, 2003, 2nd Edition, 2003; and Test Methods for the Examination of Composting and Compost, 2002, or updated versions of these methods.[7] Testing parameters will include the following parameters.

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[6] The laboratory performing testing must be approved by the California Department of Health Services in its Environmental Laboratory Accreditation Program and participate in the North American Proficiency Testing Program.

[7] These test methods must be used pursuant to the Stanislaus County February 2005 "Food Processing By-Products Use Program."

By-Product Testing Parameters*

Basic Physical and Chemical Properties	
Parameter	***Reporting Units***
Total Solids	Percent (%)
Moisture	%
Volatile Solids	%
Bulk Density	Pounds per Cubic Yard (lbs/yd^3)
Total Organic Carbon	%
pH	Standard Units (S.U.)
Electrical Conductivity	mmhos/cm
Major Plant Nutrients (Dry Weight Basis)	
Total Kjeldahl Nitrogen	Parts per Million (mg/kg)
Ammonium-Nitrogen	mg/kg
Nitrate-Nitrogen	mg/kg
Total-Phosphorus	mg/kg
Total-Potassium	mg/kg
Sulfur	mg/kg
Carbon/Nitrogen Ratio	Calculated
Micro Nutrients and Selected Salts (Total, Dry Weight Basis)	
Boron	mg/kg
Calcium	mg/kg
Chloride	mg/kg
Copper	mg/kg
Iron	mg/kg
Magnesium	mg/kg
Manganese	mg/kg
Molybdenum	mg/kg
Sodium	mg/kg
Zinc	mg/kg
Selected Heavy Metals (Total, Dry Weight Basis)	
Aluminum	mg/kg
Arsenic	mg/kg
Cadmium	mg/kg
Chromium	mg/kg
Lead	mg/kg
Mercury	mg/kg
Nickel	mg/kg
Selenium	mg/kg

*At a minimum, plant by-products need to be sampled/tested for moisture, total nitrogen, organic carbon, sodium, calcium, magnesium, and phosphorus per the Stanislaus County February 2005 "Food Processing By-Products Use Program."

REPORTING AND RECORDKEEPING

Copies of all laboratory quality data (including chain-of-custody documentation) should be provided to operators of the land application sites and be maintained at the plant. Note that this data will be required for land application operators to calculate agronomic loading rates and to prepare/submit annual land application reports.

Product Sampling Results

The product sampling results will be included in the data and technical review process.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO. R5-2006-0052

REGARDING THE REUSE OF FOOD PROCESSING BY-PRODUCTS
WITHIN STANISLAUS COUNTY

WHEREAS, the California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. In 1978, Stanislaus County established a voluntary Food Processing By-Products Use Program (hereafter "Program") to divert solid and semi-solid food processing by-products from county landfills. Under the Program, the County permits food processors (both within and outside the County) to transport food processing by-products for use in land application, direct animal feed, dehydration, and composting operations. Under current State landfill regulations, the majority of the diverted food processing by-products is too wet to be accepted at landfills.

2. The types of solid and semi-solid food processing by-products historically included in the Program include rejected fruit and vegetable products, solids screened from food processing wastewater, wastewater, and nutrient- and organic-rich sediment generated from the recycling of water in food processing flume conveyance systems.

3. Stanislaus County and its permit holders (i.e., the entities accepting the by-products) state that solid and semi-solid food processing by-product is a valuable commodity which improves soil and nourishes animals; the diversion of such by-products from landfills is of public benefit; and the regulated operations are environmentally sound.

4. Stanislaus County Department of Environmental Resources' program criteria is set forth in the "*Stanislaus County Food Processing By-Products Use Program, May 2006*," (found as Attachment A, which is attached hereto and made part of this Resolution by reference). Any entity wishing authorization to accept solid or semi-solid food processing by-products must submit a permit application containing a detailed plan of operation and allow the County to make inspections and to take any necessary enforcement actions.

5. The County requires that its permit holders submit a performance bond for clean-up and remediation at the permitted site and reimburse the County for all costs incurred for permit administration, including, but not limited to, processing the permit application, enforcing the permit terms, and some monitoring of the permitted activity at the permit location. Annual reports must be submitted at the end of each food processing season.

6. The Program allows food processing by-products to be discharged at four types of sites, and contains specific conditions for each of these re-use operations, as summarized below:

   a. For *land application operations*: the land must be cropped; the by-products must be applied in a manner that precludes the potential for nuisance odors and vectors; the by-product must be applied at agronomic rates established by a Certified Professional Soil Scientist, a Certified Professional Agronomist, or a Certified Crop Advisor; the by-products must be analyzed for selected constituents; and the soil in the land application areas must be analyzed prior to discharge.

b. For *direct (animal) feed operations*: the by-products must be delivered to a cement or asphalt pad; the by-products shall not be fed to animals on open ground; and the volume of by-products delivered shall not exceed that which will be fed or processed within 24 hours of delivery to the site.

c. For *dehydration and composting operations*: the by-product shall be delivered to a cement, asphalt, or compacted soil pad and shall be processed within 24 hours.

7. The activities described in this Resolution result in the discharge of waste, as defined in California Water Code (CWC) section 13050. Pursuant to the CWC and implementing regulations, (a) liquid, solid, and gaseous waste substances from a food producing or processing operation are "waste," (b) an element or compound reasonably expected to be in or derived from such waste is a "waste constituent," and (c) a waste transformed under natural conditions through biological and chemical processes into waste constituents that will not impair groundwaters is "decomposable waste."

8. Pursuant to CWC Section 13050, substances from food producing or processing operations referred to in the Program as "food processing by-products" that are comprised of and yields decomposable waste and waste constituents are considered waste that is subject to regulation under the CWC. For purposes of this Resolution these wastes will be referred to as "food processing by-products".

9. Regional Board staff has reviewed the Program in relation to prevention of water quality impacts and nuisance conditions. In summary:

a. For *land application operations*, the Program is adequate as currently implemented to prevent creation of nuisance conditions and to prevent impacts to surface water. In addition, nitrogen loading rates appear protective of water quality. However, a literature review (and possibly additional study) is needed to determine the appropriate regulatory approach, requirements, and best management practices necessary to ensure that the Program is adequate to control, protect and monitor the application of food processing by-products to land to ensure the protection of water quality and the environment. The following issues need to be reviewed, studied, and assessed:

(1) Determine an adequate monitoring program for the by-products, soil and groundwater, considering site and by-product characteristics and conditions.

(2) Evaluate and determine the actual or potential water quality impacts that (a) high strength and (b) low pH food processing by-products may have in land application practices. Develop proper controls, management measures and prohibitions (given site and waste characteristics and conditions) to address these types of food processing by-products applied to land.

(3) Determine the percentage of total dissolved solids (TDS) in food processing by-products that is present as volatile dissolved solids (VDS), and how much of this VDS will degrade within the soil profile.

(4) Evaluate the actual or potential impacts to groundwater of food processing by-products with a high moisture content that is applied to land prior to the planting of crops.

(5) Evaluate the actual or potential impacts to groundwater caused by on-site storage of food processing by-products during rain events. Develop proper controls, management measures and prohibitions given site and waste characteristics to ensure storage of food processing by-products is done in a manner that is protective of groundwater quality.

(6) Identify site and waste characteristics and conditions that would prohibit the application of food processing by-products to land, and

(7) Establish requirements that prohibit the discharge of liquid wastes to land under the County's program.

b. For *direct (animal) feed operations*, the Program is adequate as currently implemented to prevent nuisance conditions and adverse impacts to waters of the State.

c. For *dehydration and composting operations*, the Program is not adequate to prevent nuisance conditions and adverse impacts to waters of the State with respect to leachate and storm water impacts, and because such facilities have multiple water quality issues, they are more appropriately regulated under either individual or general WDRs. Stanislaus County has agreed that it is appropriate for the Regional Board to regulate these sites outside the scope of this resolution.

10. While the land application of food processing byproducts has great benefit in reducing the amount of material taken to landfills and in enhancing soil structure, there is a possibility that certain aspects may threaten groundwater quality. Stanislaus County has proposed that a literature review, and subsequent study if necessary, be completed to determine (a) the impacts to groundwater from the land application of solid and semi-solid food processing by-products and (b) safeguards to protect water quality from such a discharge. It is appropriate to allow Stanislaus County to continue its Program while additional data is collected, subject to the conditions listed in this Resolution. The literature review and any needed study will be designed to provide information with respect to the effects or threatened effects of food processing by-products on waters of the state and to help determine the appropriate regulatory mechanism for the discharge of food processing by-products on a County-wide or possibly Region-wide basis. This Resolution does not waive WDRs nor delegate responsibility to the County. Instead, it postpones Regional Board action pending outcome of the literature review and any necessary study.

11. Pursuant to CWC section 13225, the Regional Board may require any state or local agency to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water. This Resolution requires Stanislaus County to undertake a literature review (and subsequent study if necessary) to determine any impacts of food processing by-products on groundwater quality, and best management practices to protect water quality. CWC section 13325 also authorizes the Regional Board to request enforcement by appropriate federal, state and local agencies of their respective water quality control laws. This Resolution requires Stanislaus County to adopt an Ordinance or other legal mechanism to fully implement and enforce the Program. This Resolution does not delegate the Regional Board's authority to Stanislaus County, as such delegation is not authorized by the Water Code. This Resolution sets forth tasks that should provide information to support adoption of a Regional Board regulatory program that could include waste discharge requirements (WDRs) or a waiver of WDRs.

12. This Resolution does not limit the authority of the Regional Board to enforce CWC Division 7 or other applicable laws. This Resolution does not constitute WDRs or a waiver of WDRs. This Resolution does not authorize or approve the Program. This Resolution requires the County to undertake a literature review, and a subsequent study if necessary, to address the issues described in Finding No. 9.a. The Regional Board retains its authority to issue WDRs, waive WDRs, and take enforcement action as appropriate. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this resolution does not create a vested right to continue any discharge that occurs under the Program.

13. Known operators and other interested parties and persons were notified of the intent to adopt a resolution regarding the Stanislaus County Program and were provided an opportunity to submit written comments and for a public meeting.

14. A public meeting was held on 22 June 2006 in Rancho Cordova, California to consider comments concerning this matter.

THEREFORE, BE IT RESOLVED that:

1. Stanislaus County shall continue to implement, inspect, monitor, and enforce its *Stanislaus County Food Processing By-Products Use Program, May 2006* or subsequent revisions thereto;

2. According to the following schedule, Stanislaus County shall oversee a literature review (and if necessary, a study) to determine the impacts of food processing by-products on groundwater quality, and to specifically address the issues listed in Finding No. 9.a. The study team and researchers shall regularly consult with staff of the Department of Food and Agriculture, California Integrated Waste Management Board, and Regional Board.

   a. By **1 August 2006**, Stanislaus County shall submit a workplan to the Executive Officer describing in detail the work to be completed, any additional soil or by-product monitoring to be completed, the name of the principal investigators and researchers, and the funding

source(s). At a minimum, the workplan shall include:

- A literature review;
- A technical review of the Stanislaus County Program and existing locally generated data;
- An assessment of the current local legal authority of Stanislaus County to adequately implement and enforce its program; and
- Development of a field-ready Manual of Best Practices that includes management methods, waste prevention, and waste minimization actions that will minimize potential water quality impacts at by-product land application sites, including but not limited to: (a) a reduction of the salinity and water content of the food processing by-products applied to land and (b) an increase in the pH of the food processing by-products applied to land.

b. By **1 January 2007**, Stanislaus County shall submit the results of the literature review.

c. By **1 April 2007**, Stanislaus County shall submit a review of existing data, including that data collected at County-permitted land application sites from the years 2000 through 2006.

d. By **1 July 2007**, Stanislaus County shall submit a final report to the Executive Officer. The report shall include the results of all work described in No. 2.a (above), as well as any proposed changes to the Stanislaus County Program to fully protect surface and groundwater quality.

e. By **1 January 2008**, Stanislaus County shall adopt an Ordinance or other legal mechanism that provides for implementation and enforcement of the Program

f. Stanislaus County shall submit quarterly progress reports suitable for inclusion in the Executive Officer's report section of the Regional Board agenda (due by 30 September 2006, 30 December 2006, and 30 March 2007).

g. Stanislaus County shall schedule meetings as necessary to apprise the Executive Officer and staff as to the progress of the work described in Section 2.a (above).

BE IT FURTHER RESOLVED that it is the intent of the Regional Board that the outcome of the study will support the adoption of an appropriate regulatory mechanism (i.e., a waiver of WDRs or similar instrument) for the land discharge of food processing by-products prior to the spring of 2008.

AND BE IT FURTHER RESOLVED that this Resolution does not create a vested right to discharge waste and the Regional Board may modify or terminate this Resolution at any time. Nothing in this Resolution limits the authority of the Regional Board to enforce CWC Division 7 or other applicable laws.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, on 22 June 2006.

Pamela C Creedon

PAMELA C. CREEDON, Executive Officer

Related Documents:

- Attachment A: Stanislaus County Food Processing By-Products Use Program, May 2006

WSW: 27 June 2006

ATTACHMENT A TO RESOLUTION NO. R5-2006-0052

Stanislaus County

Food Processing By-Products Use Program

Land Application
Direct Feed
Dehydration
Composting

Prepared by
Department of Environmental Resources

May 2006

Table of Contents

Welcome to Stanislaus County, we appreciate your contacting the Department of Environmental Resources (DER or Department) to explore your interest in the land application, direct feed, composting and/or dehydration of food processing by-products. The DER has prepared this comprehensive guide to our program so you will understand what is expected of our applicants. Should you have questions that are not answered here, please contact our office at 525-6700 and ask for the solid By-Product unit.

A permit from the DER is required for any operator wanting to apply food-processing by-products to land, direct feed, composting and/or drying. A Plan of Operation, a performance bond, proof of required insurance coverage, and annual regular inspections by DER staff are also required.

The planned use of the by-products may trigger the CEQA environmental review process. The DER, as lead agency, will prepare an initial study based on information provided by the Applicant. The DER will determine whether the project may cause significant environmental impacts, and adopt the appropriate level of mitigation, if any.

Definitions:

Food processor: A processor of fruit, nut or vegetable raw products which may include but are not limited to tomato, peaches, almonds, walnuts, pears, grapes, raw olives, grain products or other raw plant material, i.e., canneries, nut processors, vegetable processors, frozen food processing, etc.

By-product: Food processing by-products are solid or semisolid substances derived from agricultural plant material delivered to a food processor for processing that are not utilized in the final product. Food processing by-products include but are not limited to culls, peelings, seeds, under or over ripe food, skins, cores, pomace, puree, hulls, shells, pits, stems, leaves and any substance including soil washed from plant produce.

Permit:

The permit application is the first step in being authorized to apply food processing by-products to land, direct feed, composting or dehydration in Stanislaus County. You are required to identify the proposed site and all the persons involved in the operation. The initial application fee, annually thereafter, is based on a weighted labor rate for staff time associated with the processing of your application, administering the program and enforcing the program will be billed to you by the Accounting unit.

- Permit approval process: The Department may grant a permit for food processing by-products use, upon application therefore whenever in the opinion of the Department the granting of such permit is in the public interest and welfare and in compliance with all

applicable local, State and Federal regulations including any CEQA or other environmental reviews required by law.

- Permit appeal process: Should DER deny the permit application, an Applicant may appeal to the Board of Supervisors. Such appeal must be in writing and must be received by the clerk of the Board not more than fifteen days after denial of the permit. Appeals filed shall be accompanied with a fee in an amount set by resolution of the Board. The hearing on such appeals shall be after notice of the time thereof has been mailed to appellant at least seven days before the hearing. Any appeal not accompanied by the required fee within the fifteen-day period described above shall be deemed untimely. (Stanislaus County Refuse Ordinance 9.12.080)

- Permit renewal process: Permits may be renewed upon expiration thereof provided the department finds that the permit holder is capable of continuing operation in conformity with the provisions of the Stanislaus County Refuse Ordinance and the rules and regulations of DER.

Fees:

The permit holder shall reimburse the Department for all costs incurred by it in administering this permit, including, but not limited to, processing the permit application, enforcing the permit terms, and monitoring permitted activity at the permit location. The Department shall issue an invoice itemizing all costs incurred by the Department and the permit holder shall remit payment as shown in invoice within 30 days of the invoice date. All costs will be based on the current weighted labor rates of the appropriate Department Staff member. A late payment charge equal to 1.5 percent of the unpaid invoice amount shall accrue and shall be added to the total amount each month that an invoice payment is past due.

Sampling/Testing:

The following references (and all updated versions thereafter) may be used for methods analyses made pursuant to this: Soil, Plant and Water Reference Methods for the Western Region, 2003, 2nd Edition, 2003 and Test Methods for the Examination of Composting and Compost. 2002.

The Laboratory performing the analysis shall be certified by the California Department of Health Services in its Environmental Laboratory Accreditation Program and participate in the North American Proficiency Testing Program.

Agronomic rates shall be established by a Certified Professional Soil Scientist certified by the SSSA Certification Board (formerly known as ARCPACS), a Certified Professional Agronomist (CPAg) certified by the American Society of Agronomy

(ASA) Certification Board, (formerly known as ARCPACS) or a Certified Crop Advisor certified by the California Certified Crop Advisor Board.

Performance Bond:

To further ensure compliance with program requirements, the permit holder shall submit a cash bond, certificate of deposit, irrevocable letter of credit, or a faithful performance bond in favor of the DER, in an amount equal to 125 percent of the estimated cost (as determined by the DER) for clean-up and remediation at the permit location. This shall occur at or before the time the permit is issued. If submitting a faithful performance bond, the applicant will be required to complete a performance bond form. For more information regarding this requirement, please contact the DER.

Insurance:

Provide a certificate of current insurance on all hauling vehicles: $1,000,000 GL, & $100,000 PD, minimum coverage extending through the permit period. Vehicle license numbers shall be indicated on the forms.

Site Inspections:

The DER will inspect the site(s) prior to issuing a permit to assure that requirements listed below are met. During the period when applications occur and for 24 days following the end of a season or termination of the program the DER will inspect the site(s) to assure that the permitee is adhering to conditions of the permit and Plan of Operation. Inspections will occur weekly or at other frequencies determined by the DER.

Vehicle Inspections & Hauler Requirements:

The DER must perform an annual inspection of vehicles collecting and/or transporting food processing by-products, and an identification sticker will be issued and shall be displayed on each vehicle. Prior to the beginning of the season, please contact the DER for inspection appointments. The following are checked during each inspection: leakproof beds/bodies, load covering, current vehicle registration, broom and shovel, fire extinguisher, operable brake lights and turn signals. At the time of inspection applicant must provide proof of certification/documentation that the hauler complies with the California Department of Business, Transportation and Housing B.I.T. Program, and that all drivers have a Class A License with prior endorsements from the Department of Motor Vehicles and the California Department of Transportation.

ALL APPLICANTS SHALL SUBMIT A "PLAN OF OPERATION"

In order for your Application and Plan of Operation to be considered COMPLETE, please answer all applicable questions on the following pages and provide all applicable information.

It may be necessary for you to provide additional information and/or meet with DER staff to discuss the application. Pre-application meetings are not required, but are highly recommended. An incomplete application will be placed on hold until all necessary information is provided to the satisfaction of the DER. An application will not be accepted or approved without all of the information identified being provided.

1. List the owner of the site. If different from the permit applicant, list the property owner's name, mailing address and phone number. If the parcel is under a different ownership, the project applicant must provide a notarized letter from the owner that states that applicant has the owner's consent to conduct the proposed project on that parcel and that the owner has approved the proposed plan of operation.

2. List the address and the assessor's parcel number(s) of the site.

3. List the general plan and zoning designation of the site.

4. List the current use of the site.

5. List the soil types of the project site. List their approximate absorption/water holding capacities.

6. List the approximate depth to groundwater at the site. State how the depth was determined, and the month and year the depth was determined.

7. Provide a vicinity map showing the location of the site and all proposed delivery routes.

8. Provide a plot plan drawn to a legible scale which clearly shows the intended project. The map must contain the following physical data:

- Sufficient description to define the location, date, north arrow, scale and boundaries; (full width of all public and private road ways bordering the property must be shown);
- Name and address of recorded owner(s);
- Name and address of person(s) preparing the map;
- Acreage to the nearest acre;
- Location and size of all waterways, drainage courses, pipelines, existing irrigation and drainage facilities, irrigation and drainage patterns, existing or proposed water wells,

septic tanks and drainage (leach) fields, sewage lines and structures used in connecting therewith, slope of the land; and

- Outline of existing buildings and other structures to remain in place within the project area, showing the distance to existing or proposed public and private road ways.

9. Provide an 8½" x 11" reproducible, to scale, legible area map showing specific land uses (crops, houses, buildings, parcel lines and parcel sizes, etc.) for the adjacent two parcels in each direction from the subject property.

10. Provide a list of names, addresses and assessment numbers of all properties located within ¼ mile (1320 feet) and/or two parcels in each direction of applicant's project. Said information must be taken from the latest assessment roll of the subject county. A written notice of the permit application to operate a Food Processing By-Product Use Site will be sent by the applicant to those property owners located within ¼ mile (1320 feet) and/or two parcels in each direction of the subject site. The notice will include a description of your project approved by DER staff. Documentation of the notice must then be submitted to DER staff.

11. Name the site manager, provide a mailing address and list a 24-hour contact phone number.

12. List the types of by-product you plan to accept at the site, and describe how by-product will be ultimately utilized.

13. List the names, addresses, phone numbers and contact persons for the food processing plant(s) that will provide the by-product.

14. List the names, addresses, phone numbers and contact persons of the hauler(s) who will haul the by-product to you site.

15. State how many tons per day of by-product will be delivered to your site. List the total tons for the season.

16. If more than one type of by-product will be delivered, estimate the tons per day of each type of by-product that will be delivered to the site.

17. State how many truckloads per day will be delivered to your site.

18. Give the date that by-product deliveries will start and the date they will stop each season or indicate if you will accept the by-product year-round. Estimate how many days per year the site will accept by-product.

19. List the days of the week, and the approximate times that by-product will be delivered to your site.

20. Explain in a detailed, step-by-step manner, how you will use or process the by-products.

21. Explain in detail, the methodology to be used for tracking, receiving, storing, and depositing by-products. This tracking procedure must include records of when by-product is received, where it is received, and the location of the by-product when it is used at the site.

22. List the types of the equipment you will use to manage the by-products. Indicate if that equipment is under your ownership. List stand-by equipment available in case of equipment breakdown.

23. Explain in detail how you will prevent the following conditions from occurring, and provide contingency plans in the event these conditions occur:

- Excessive liquid accumulation and excess moisture.
- Excessive dust.
- Excessive noise.
- Excessive objectionable odors.
- Excessive fly, mosquito and/or vector nuisance.
- Inclement weather.

24. Describe how the by-products will be contained on the site and not allowed to flow or otherwise be deposited on other surrounding properties or waterways.

25. Applicant shall provide DER staff with written verification from the food processing by-product processor, that all by-products deposited on permitted sites in Stanislaus County will not pose a risk to land, air, water, to human and animal health or the environment and that utilization of the by-product as direct feed or as a soil amendment is an acceptable use of said by-product.

26. Where applicable, the site operator shall demonstrate compliance with the Central Valley Regional Water Quality Control Board's Irrigated Lands Conditional Waiver Program (Resolution No. R5-2003-0105)

GENERAL PERMIT TERMS AND CONDITIONS

All operations (land application, direct feed, composting and/or dehydration) shall comply with the following terms and conditions:

1. Only the types and amounts of food processing by-product listed in the permit application and plan of operations may be received and used at the permit location.

2. The permit holder is prohibited from receiving milk, whey, cheese by-products, meat and animal by-products, including dead animals, as well as fruit and vegetable by products that, because of processing, contain high concentrations of agriculturally and environmentally deleterious salts or constituents that have no agronomic benefit.

3. The total amount of by-product delivered to the permit location shall not exceed the amounts stated in the approved plan of operation.

4. The permit holder shall maintain a daily log approved by the DER which shall contain the following information: (a) date and time of each delivery of material, (b) name of the hauler of the material, (c) amount (by weight) delivered, (d) source of material, and (e) type of material. All daily logs shall be submitted annually to the DER and shall be made available to the DER for review and inspection upon reasonable request of the DER.

5. Written procedures acceptable to DER shall be developed whereby food processing by-product trucks are directed to the correct discharge lanes/areas during all delivery times. These procedures shall be implemented whenever the site receives food processing by-products.

6. The site shall be operated and managed at all times so that no excessive objectionable food processing by-product odors migrate off-site, and no excessive insect, rodent or other nuisances or public health hazards are created.

7. Approved spray equipment, insecticides and pesticides shall be readily available for use at all times to control flies, mosquito's, gnats and other pests. All insecticides and pesticides used shall be stored and used according to the label directions and in compliance with applicable local, state and federal rules, regulations and laws.

8. Mechanical equipment shall be readily available and be adequate to perform the necessary by-product operations. Standby equipment must be readily available, in the event of mechanical failure. If no equipment is available or if equipment becomes inoperable, no by-product materials shall be accepted at the site until operable processing equipment is available and existing stockpile is processed.

9. To prevent surface water quality degradation, ensure that all site personnel are familiar with the proper use and function of any on-site water control structures, which allow discharge. Maintain all valves that allow runoff and repair immediately as needed.

10. The permit holder grants to the DER the right of access to the permit location for all reasons and purposes reasonably related to the administration of this permit by the DER, including, but not limited to the right to enter upon the permit location to remediate any problem related to the permitted activity.

11. The permit application and Plan of Operations and supplements or amendments thereto submitted by the permit holder to obtain this permit are incorporated herein by reference. The permitted activity shall be operated in conformance with the above documents, these permit conditions and all applicable state and local laws, ordinances, regulations and codes. In the event of any conflict between the permit application or the plan of operations and the permit conditions, the permit conditions shall take precedence. All supplements, amendments or changes to the Plan of Operation must be submitted in writing to the DER for review and approval prior to initiating said changes in the permitted activity. The issuance of this permit does not release the permit holder from responsibility to comply with the permitted activity.

12. The DER may modify the conditions of this permit for cause, after prior notification to the permit holder, to eliminate, reduce or ameliorate any condition or nuisance that adversely affects the public health, safety or welfare, or threatens to unreasonably degrade the quality of surface water or groundwater.

13. The provisions of this permit are intended to be severable and if any individual condition or provision hereof is held to be invalid by the order of the Board of Supervisors, by order of any court of competent jurisdiction or for any other reason, the remaining terms of this permit shall not be affected thereby; provided, however, the DER, in its sole discretion, may terminate this permit if it determines that the permit, as modified by the severance, no longer achieves the objectives of the DER or adequately protects the public health, safety and welfare.

14. This permit may be suspended or revoked by the DER for cause. This permit is granted on the condition that the person(s) named in the permit will comply strictly with the laws, ordinances, regulations, and any specific conditions that are now or may hereafter be in forced by the State of California, Stanislaus County and the DER in the incorporated or unincorporated areas of Stanislaus County pertaining to the above mentioned business.

Notice: Conditions may be added, deleted, or modified at the sole discretion the DER. The specific conditions of your permit are valid only for the permit period, and are subject to change.

LAND APPLICATION OPERATIONS SHALL ALSO COMPLY WITH THE FOLLOWING TERMS AND CONDITIONS

1. Prior to accepting food processing by-products at the site, the soil shall be prepared to receive by-products. Clods of soil shall be broken by a Schmeizer or equivalent. The soil surface shall be leveled to reduce pocket holes and furrows. Soil shall be sufficiently dry to retain moisture applied with food processing by-product in the surface 12 inches.

2. Food processing by-product shall be discharged from the trucks as thinly and evenly as practical. Overlapping onto previously spread food processing by-product shall be minimal. Check runs shall be no longer and slopes shall be no greater than that which permits uniform infiltration, evaporation and maximum practical efficiency. The frequency of by-products application to any given area within the permit location shall not exceed the agronomic rate, but may be done in two or three lifts to allow for even drying.

3. Within twenty-four hours of deposition at the site, the food processing by-product shall be spread and crushed with a tandem drag or equivalent. The by-product shall dry for a minimum of 48 hours after which it shall be disced or harrowed. The soil should be worked to an appropriate depth. Alternate discing or harrowing and drying until final drying and incorporation into the soil are complete. In the event of inclement weather, the site operator may invoke the contingency plan outlined in the plan of operation upon approval by the DER.

4. The applicant shall maintain the following minimum setbacks for all by-product areas:

By-Product Application Setback Definition	Setback (feet)
Edge of by-product area to public property (e.g., street)	300'
Edge of by-product area to other non-owned agricultural property	100'
Edge of by-product area to occupied residences (on-site)	150'
Edge of by-product area to occupied residences (off-site)	300'

5. All cans, metal, wood, plastic, paper, cardboard, and other refuse in the food processing by-product at the site shall be removed and placed in approved containers and disposed of at an approved refuse disposal site. This refuse shall be removed and properly disposed of as needed.

6. Crops shall be grown on the land application areas. Crops shall be selected based on nutrient uptake capacity, tolerance of anticipated soil moisture and salinity conditions, water needs and evapotranspiration rates. All crops shall be grazed or they shall be harvested and removed from the by-product areas at least once per year.

7. By-product shall be tested for the following parameters and constituents: moisture, total nitrogen, organic carbon, sodium, potassium, calcium, magnesium, and phosphorus.

8. Application rates would be based on agronomic rates. An agronomic rate is that amount of by-products which meets a crop requirement without application of any by-product constituent in excess of crop requirements or as defined by the University of California Cooperative Extension. "Crop requirement," s used herein, refers to the amount of nutrients or constituents necessary for the selected crop and agronomic rate must consider the amount already available in the soil profile from ground surface to rooting depth prior to by-product application. Mass loading rates for nutrients and degradable organic compounds shall be based on the character of the by-product, crop, soil, climate and other nutrient sources.

9. Soil samples from fields to which by-products are applied shall be analyzed for cation exchange capacity, plant nutrients, total organic carbon, salinity, and sodicity. Plant nutrients must include total nitrogen, nitrate and ammonium nitrogen, available phosphorous (Olsen), potassium, magnesium, calcium and sodium. Saturation paste samples shall be analyzed for soluble salts (electrical conductivity), pH, and buffer pH (lime requirement).

   Samples shall be drawn from 1-foot intervals to the rooting depth. Alternative sampling intervals may be employed with technical justification, Each field scheduled to receive by-products in any given year should be sampled in late spring or early summer prior to the by-products application. Obtaining representative samples is critical to getting valid and interpretable analytical results. One method to ensure representative samples are collected is to conduct the soil sampling as follows. Collect soil samples from the depth intervals of 0-12", 12-24", and 24-36" at 10 to 20 sites per field based on geostatistical-based standards of practice. Mix samples taken from the same depth intervals to form a single composite sample for that depth interval. This composite sample should have a minimum weight of 1 lb. Submit each composite sample to a certified laboratory for analysis, for a total of three composite samples per field representing the three depths.

10. Land application of by-product to any sub-area or irrigation check not having a fully functional tail water/runoff control system is prohibited.

11. Applicant shall avoid excessive use of food processing by-product or practices which may create objectionable odors, soil conditions that are harmful to crops and degradation of underlying groundwater by overloading the shallow soil profile and causing by-product constituents (organic carbon, nitrate, other salts and metals) to percolate below the evaporative root zone.

12. Within sixty (60) days of the cessation of deliveries of food processing by-product to the site or at the end of the site season, the operator shall report to the DER the total amount of by-product delivered to the site (tons); the amount of by-product delivered daily (tons); a record of fields where by-products are applied, rate of application and total application/year/field; and by-product and soil sampling and testing data, and,

DIRECT FEED OPERATIONS SHALL ALSO COMPLY WITH THE FOLLOWING TERMS AND CONDITIONS

Direct Feed operations shall also contain the following information:

Indicate what type of livestock or poultry will be fed. List the percentage (by dry weight) of the feed ration at which this by-product will be used. List the number of lactating and non-lactating animals. List the number of livestock or poultry that will consume the by-product, or a list of purchasers and their intended use.

Direct Feed operations shall also comply with the following terms and conditions:

1. The by-product receiving pad shall be constructed of cement or asphalt; it must have adequate drainage facilities and prevent leaching. The pad shall be kept clean of accumulated by-product and maintained to prevent fly and mosquito production and objectionable odors.

2. By-product shall be fed on cement, asphalt or other approved manger and not applied to open ground.

3. Food processing by-product must be processed or fed within twenty-four (24) hours of delivery to the site. If the by-product is not processed or consumed within twenty-four (24) hours after delivery, no additional by-product shall be delivered to the site until such time as all by-products at the site has been consumed or properly processed per the procedures in the current site plan of operation.

4. No liquid or runoff from food processing by-product use areas shall be discharged from or allowed to drain off-site or onto adjacent property. The site shall be operated in conformance with the "Minimum Guidelines for Protection of Water from Animal Wastes," issued by the Regional Water Quality Control Board.

5. Food processing by-product used as an animal feed shall conform to the applicable sections of the "Commercial Feed Law and Regulations", as issued by the California Department of Food and Agriculture. The permit holder shall provide confirmation satisfactory to the Department that the feed meets the applicable requirements of the California Food & Agriculture Code, including but not limited to compliance with labeling, testing, and receiving sections of the Code.

6. By-product shall be tested for the following attributes: moisture, total nitrogen, organic carbon, sodium, potassium, calcium, magnesium, and phosphorus.

7. Within sixty (60) days of the cessation of deliveries of food processing by-product to the site or at the end of the site season, the operator shall report to the DER the amount of by-product delivered daily (tons); the total amount of by-product delivered to the site (tons); and by-product and soil sampling and testing data.

DEHYDRATION OPERATIONS SHALL ALSO COMPLY WITH THE FOLLOWING TERMS AND CONDITIONS

1. The by-product receiving pad shall be constructed of cement, asphalt or compacted surface area, it must have adequate drainage facilities, and prevents leaching. The pad shall be kept clean of accumulated by-products and maintained to prevent fly and mosquito production and objectionable odors.

2. By-product shall remain on the receiving pad no longer than 24 hours before processing commences.

3. By-product shall be tested for the following attributes: moisture, total nitrogen, organic carbon, sodium, potassium, calcium, magnesium and phosphorus.

4. Within sixty (60) days of the cessation of deliveries of food processing by-product to the site or at the end of the site season, the operator shall report to the DER the amount of by-product delivered daily (tons); the total amount of by-product delivered to the site (tons); and by-product and soil sampling and testing data.

5. Site shall comply with appropriate Regional Water Quality Control Board requirements which may include individual or general WDRs

COMPOSTING OPERATIONS SHALL ALSO COMPLY WITH THE FOLLOWING TERMS AND CONDITIONS

1. The by-product receiving pad shall be constructed of cement, asphalt or compacted surface area, it must have adequate drainage facilities, and prevent leaching. The pad shall be kept clean of accumulated by-products and maintained to prevent fly and mosquito production and objectionable odors.

2. By-product shall remain on the receiving pad no longer than 24 hours before processing commences.

3. By-product shall be tested for the following attributes: moisture, total nitrogen, density, organic carbon, sodium, potassium, calcium, magnesium. Where composting is over packed soil samples shall be taken from the surface three feet in one-foot increments. Analytes shall include at a minimum pH, nitrate nitrogen, Olsen phosphorus, ammonium acetate extractable potassium, electrical conductivity of the saturation extract and sodium absorption ratio. The top foot of access holes hall be backfilled with bentonite clay to minimize leaching and to prevent re-sampling back fill material.

4. Within sixty (60) days of the cessation of deliveries of food processing by-product to the site or at the end of the site season, the operator shall report to the DER the amount of by-product delivered daily (tons); the total amount of by-product delivered to the site (tons); and by-product and soil sampling and testing data.

5. Site shall comply with appropriate Regional Water Quality Control Board requirements which may include individual or general WDRs

SITE ACTIVITY LOG
TONNAGE REPORT

Site Name:

Address:

Site Operator:

DATE	TYPE OF RESIDUE	HOW MUCH RESIDUE (BY TON)	HAULER	SOURCE OF RESIDUE	SOURCE IN STANISLAUS COUNTY (Yes or No)

F:/DATA/Swaste/FoodResiduePermits/TonnageReportBySite-Template

FOOD PROCESSING RESIDUE USE SURVEY
YEAR _____

Business Name : _____
Business Address : _____
City _____ **State** _____ **Zip Code** _____
Mailing Address : _____
City_____**State** _____ **Zip Code** _____
Person Completing Form : _____
Phone No. : _____

TYPE OF RESIDUE[1]	HAULER(S)	USE SITE & LOCATION	WEIGHT OF RESIDUE[2] (in tons)

[1]PLEASE itemize each type of residue.
[2]PLEASE express the weight of the residue in tons.

Return the completed survey form to:
DEPARTMENT OF ENVIRONMENTAL RESOURCES
3800 Cornucopia Way, Suite C
Modesto, California 95358-9494

F:/Data/Swaste/FoodResiduePermits/FoodProcessingResidueUseSurveyForm

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

AGREEMENT FOR MONITORING AND REPORTING OF
SOLID AND SEMI-SOLID FOOD PROCESSING BY-PRODUCTS APPLIED UNDER THE
STANISLAUS COUNTY PROGRAM

This Monitoring and Reporting Program (MRP) describes the agreement reached between Stanislaus County and Regional Board staff regarding monitoring and reporting for the solid and semi-solid food processing by-products discharged under the Stanislaus County "Food Processing By-products Use Program" (hereafter County Program) and the sites to which the by-products are applied.

Monitoring shall be conducted by either Stanislaus County or by the permittees in the County Program. If conducted by the permittees, then Stanislaus County shall oversee the monitoring and reporting requirements. Stanislaus County shall be responsible for submitting the annual report.

All laboratory results shall be reported to the method detection limit (MDL). Non-detected results shall be reported as less than the MDL (<MDL). Results above the MDL, but below the concentration of the lowest calibration standard for multipoint calibration methods or below the reporting limit for other methods, shall be flagged as estimated.

Analytical procedures shall comply with the methods and holding times specified (and all updated versions thereafter) in: *Methods for Chemical Analysis of Water and By-products* (EPA-600/4-79-020, 1983); *Methods for Determination of Inorganic Substance in Environmental Samples* (EPA/600/R-93/100, 1993); *Standard Methods for the Examination of Water and By-productwater, 20th Edition* (WEF, APHA, AWWA); *Soil, Plant and Water Reference Methods for the Western Region, 2003,* 2nd Edition, 2003 (hereafter Western Region Methods) and *Test Methods for the Examination of Composting and Compost.*

DIRECT ANIMAL FEED OPERATIONS

Daily records shall be kept detailing the name of each facility permitted under the County Program, the type and amount of food processing by-product delivered, the hauler, the source of the by-product, and the type of receiving pad to which by-product is delivered.

LAND APPLICATION OPERATIONS

The remainder of this Monitoring and Reporting Program applies to sites at which solid and semi-solid food processing by-product is applied to cropland.

A. BY-PRODUCT CONSTITUENT MONITORING

Samples shall be collected from the food processing by-products delivered to each site, and shall be monitored for the following parameters: moisture, total nitrogen, organic carbon, total dissolved solids, sodium, chloride, sulfate, potassium, calcium, magnesium, phosphorus, and

metals (i.e., arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc). Results shall be reported on both a wet weight and dry weight basis. Each sample shall be a composite of a number of samples collected from the same load. Samples shall be collected from at least 2% of all loads taken to a site, and the sampling program shall ensure that each by-product source/type is represented. Results shall be reported for each site and for each source of food processing by-product.

Alternatively, Stanislaus County may submit a *Solid Food Processing By-Product Characterization Report* containing a compilation of analytical data collected during the previous 15 years for by-products applied to permitted land application sites. The data shall be sorted by type of food processing by-product (i.e., tomatoes, olives, peaches, etc.). If the data shows that certain constituent concentration are relatively constant for a particular by-product stream, then the County may request a reduced sampling program for that type of by-product and that constituent(s). Until this report is submitted and approved by the Executive Officer, the by-product constituent monitoring described in the first paragraph shall be implemented.

B. LAND APPLICATION AREA MONITORING

Each entity permitted by Stanislaus County shall maintain a daily log and record in the log, at a minimum, the following information:

(a) date and time of each delivery of the by-product,
(b) name of the hauler,
(c) amount (by weight) delivered,
(d) source (generator) of the by-product,
(e) type or category of by-product, and
(f) whether the by-product came directly from the generator or was first taken to a transfer station.

For each field receiving by-product, the following information shall be monitored and recorded:

(a) starting and ending dates of irrigation and hydraulic loading (in/month),
(b) number of acres where the by-product was applied,
(c) dry and wet tons of by-product applied,
(d) nitrogen loading derived from byproduct applications (lbs/acre/month),
(e) nitrogen loading derived from fertilizer (lbs/acre/month),
(f) yearly cumulative nitrogen loading (lbs/acre/month) from by-products and commercial fertilizers (starting in January),
(g) yearly cumulative TDS loading (lbs/acre/month),
(h) type(s) of crops grown, dates of planting and harvest, tons of crop removed per acre, and
(i) tons of nitrogen removed by crop in tons/acre/year (based on standard nitrogen uptake as provided in a recognized reference).

C. SOIL MONITORING

Soil collection method and soil sampling depths shall be in accordance with the County's Program. Each permitted Land Application operation shall establish representative background soil sample locations to characterize the quality of soil that has not been, and will not be, utilized for land application of solid food processing by-product. In addition, the soil in each field receiving by-products shall be sampled pre- and post-application.

Background soil samples, pre-application soil samples, and post-application soil samples shall be analyzed annually for the following: cation exchange capacity, buffer pH, salinity, plant nutrients, and total organic carbon. Plant nutrients must include total nitrogen, nitrate-nitrogen, ammonium-nitrogen, available phosphorus (Olsen), potassium, magnesium, and calcium. Saturation paste samples shall be analyzed for pH, soluble salts (electrical conductivity), calcium, magnesium, chloride, sodium, and sodium adsorption ratio.

REPORTING

The data shall be arranged in tabular form so that the date, sample type (e.g., soil), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate spatial or temporal trends, as applicable.

A. ANNUAL REPORT

By 1 April of each year, the County shall submit a comprehensive annual report, which shall include:

1. A tabulation of the information listed in the "Direct Animal Feed Operations" section.

2. A tabulation and discussion of the results of the By-product Constituent Monitoring, Land Application Area Monitoring, and Soils Monitoring.

3. A list of sites, owner, and operator contact information for all animal feed and land application sites authorized to operate under the Program the previous calendar year, or a list of deletions and additions keyed to a previously submitted list. The County shall provide a brief explanation for each deletion.

4. A summary of the inspection and/or sampling activities conducted by the County to evaluate compliance of each permittee with the County Program. The summary shall identify enforcement actions (e.g., citation, warning letter, permit rescission, etc.) issued to each permittee as a result of noncompliance or threatened noncompliance and their effect.

5. A copy of each permittee's annual report submitted to the County for the previous calendar year.

6. A discussion of any data gaps or potential deficiencies/redundancies in the monitoring system or reporting program.

7. A description of any proposed significant changes in operating the County's Program. Significant changes include, but are not limited to, changes concerning: the Program's administrative structure, local discharge limitations or conditions, monitoring program or monitoring frequencies, legal authority or enforcement policy, funding mechanisms, resource requirements, or staffing levels.

A letter transmitting the self-monitoring reports shall accompany each report. The transmittal letter shall contain a statement by the Director of the Department of Environmental Resources, Stanislaus County, or the Director's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete. The Director shall sign the annual report with the following certification, whether written or implied:

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

Alternatively, Stanislaus County may require that each permitted entity submit their annual report with the above certification. In that case, the Director of the Department of Environmental Resources shall not be required to provide the certification.

The County shall implement this agreement as of **1 July 2006**.

Attachment B - Itemized Budget

Project 07-8-002-11
Food Processing By-Products Land Application: *The Stanislaus County Model*
FY2007-08 Last Updated 03-07-07

Account Codes	Description	Stanislaus County/Industry Funding
Salaries, Wages, and Benefits	***Subtotals***	**66,600**
601202	Part Time Faculty	
601301	Management & Supervisory	
601401	Regular Staff	45,600
601701	Faculty Release	
601701	Additional Employment (Summer Salary)	
601701	Temporary Help	
601801	Student Assistant	0
601802	Bridge Student Assistant	
601910	Personal Service Reserve (Benefits)	21,000
Operating Expense	***Subtotals***	**3,148**
603107	Computer Maintenance	
603111	Dues & Subscriptions	300
603119	Memberships	
603121	Moving Expense	
603122	Multi-Media Services	
603123	Non-Capitalized Computer Equipment	
603124	Non-Capitalized Equipment	
603126	Office Supplies	
603127	Other Computer Services	
603131	Postage	250
603132	Printing	250
603139	Software Non-Capitalized	
603141	Software Licenses	
603145	Supplies & Miscellaneous Expenses	2,348
603146	Fuel Gasoline Expense	0
Travel	***Subtotals***	**7,500**
603201	Travel In-State	6,000
603202	Travel Out-of-state	1,500
Contractual Services	***Subtotals***	**26,183**
603301	Consulting Services	
603302	Equipment Rental/Lease Agreements	
603304	Interagency Agreements	
603305	Intra-Agency Agreements (CSU Stanislaus)	26,183
603310	Contractual Services-Other	
Equipment	***Subtotals***	**0**
603401	Equipment Over $5,000/item	
603403	Computer Equipment Over $5,000/item	
Telephone Charges	***Subtotals***	**917**
603501	Cell Phone	650
603504	Telephone Moves/Adds/Changes	
603505	Telephone Usage	267
Indirect Charges	***Subtotals***	**15,652**
	TOTALS	**$120,000**