

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER __

WASTE DISCHARGE REQUIREMENTS

FOR
SYNGENTA SEEDS, INC.
WOODLAND SEED PROCESSING FACILITY
YOLO COUNTY

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

1. On 1 September 2011, Syngenta Seeds, Inc. submitted a Report of Waste Discharge (RWD) that describes the expansion of an existing seed processing facility that generates process wastewater and residual solids that are discharged to land in Yolo County. An addendum to the RWD was submitted on 7 January 2013.
2. Syngenta Seeds, Inc. (hereafter "Discharger") owns and operates the facility that generates the waste and the land discharge areas and is responsible for compliance with these Waste Discharge Requirements (WDRs).
3. The facility is located at 21435 County Road 98 approximately 1.5 miles south of the City of Woodland (Section 18, T9N, R2E, MDB&M). The facility occupies Assessor's Parcel Number (APN) 041-030-14, as shown on Attachment A, which is attached hereto and made part of this Order by reference.
4. WDRs Order R5-2008-0158, adopted by the Central Valley Water Board on 23 October 2008, prescribes requirements for the discharge. Order R5-2008-0158 allows a total annual wastewater flow of up to 493,000 gallons. The Discharger proposes facility site improvements that would result in increased wastewater flows. Therefore, Order R5-2008-0158 will be rescinded and replaced with this Order.

Existing Facility and Discharge

5. The facility is a commercial seed operation. The facility is located on 160 acres of land that consists mainly of agricultural fields, but also incorporates offices, storage and equipment sheds, fruit processing areas, and greenhouses. The facility process seeds from peppers, tomatoes, watermelons, cantaloupe, and squash that are grown onsite or in the greenhouses. A facility site plan is shown on Attachment B, which is attached hereto and made part of this Order by reference.
6. Fruits are mechanically crushed. Coarse solids, such as fruit rinds, are removed and stored temporarily in a bin. The seeds are removed, and the remainder of the fruit (small pieces of rind, skin, pulp, and juice) is flushed into the process wastewater drain by a flume. Antimicrobial solutions are added to the wet seeds before they are placed in rotating drum dryers. Once dry, the seeds are transferred indoors, where they may be further treated with antifungal agents prior to packaging. The seeds

produced at the facility are ultimately used at other farms to create hybrid strains, which are also harvested for seed that is sold to farmers for crop production.

7. The majority of the process wastewater is generated during the typical operating season between July and October. Wastewater is generated from fruit washing, seed extraction, greenhouse container sterilization, washing of equipment and processing areas, and evaporative cooler temperature control systems drainage.
8. The majority of the wastewater is generated from the Southern Area which is the outdoor processing area that consists of three concrete slabs, where seed extraction, fruit washing, and greenhouse container sterilization takes place. Wastewater drains into a 1,000-gallon holding tank, and is then pumped through parabolic screens into a 3,000-gallon storage tank prior to land application. Screened solids are collected in a bin for land application with other residual solids.
9. The Greenhouse Area produces a low volume intermittent waste stream from growing and washing fruits and evaporative cooler temperature control systems drainage. Several greenhouses are used to grow seedlings and mature plants whose seeds are used for research. All of the greenhouses have evaporative cooling systems that are used to prevent the temperature from rising above about 90 degrees Fahrenheit. Most of the greenhouse cooling systems are closed loop systems with no waste discharge. However, six 2,800-square foot greenhouses generate small volumes of saline wastewater that is drained from the system to reduce salt accumulation on the cooling pads. Sulfuric acid is added to the cooling system supply reservoirs to control mineral scaling. The greenhouse cooling system wastewater is conveyed by aboveground tubing and piped to a 2,000-gallon trailer-mounted tank, which is periodically dumped into the 3,000-gallon process wastewater holding tank.
10. The combined process and greenhouse wastewater is pumped from the 3,000-gallon holding tank to the 3.1-acre wastewater land application area (LAA), which is cropped with turf grass. The LAA is divided into several checks. Wastewater is applied by sprinkler irrigation. Flow to each check is controlled by manual valves. Supplemental fresh water is added as needed. The grass is periodically harvested each season.
11. During the processing season, process wastewater and storm water runoff from the Southern Area is collected and discharged from the 3,000 gallon holding tank to the LAA. At the end of the processing season, the concrete pads, sumps, and collection lines are flushed with fresh water. The collected rinse water is pumped to the LAA. The line separating the 1,000-gallon and 3,000-gallon tanks is closed with a valve, allowing subsequent storm water to be diverted to an adjacent agricultural ditch, which drains to Willow Slough, without entering the 3,000-gallon tank.
12. The Southern Area, greenhouses, and future hardening off area utilize a number of chemicals for treatment and sterilization of extracted seeds.

a. A summary of chemical usage for the Southern Area is shown below:

Southern Area Chemical Usage		
Chemical	Concentration (percent)	Annual Usage (gallons per year)
Pectinex ® 3XL ¹	NA	5
Trisodium phosphate (TSP)	10	355
Muriatic acid	31	80 to 140
Tsunami ® 100 ²	NA	4 to 8
Physan 20™ ³	NA	4
Sodium hypochlorite	12.5	65
PHYSAN 20™ ³	NA	10

NA denotes not applicable.

¹ An enzyme that hastens the breakdown of plant cell walls.

² An antimicrobial agent used on seeds that contains 31% acetic acid, 11% hydrogen peroxide, and 15% peroxyacetic acid.

³ A quaternary ammonium compound mixture used as a microbiocide on seeds and for seedling tray sterilization.

b. A summary of chemical usage for the greenhouses and future seedling/hardening off areas is shown below:

Greenhouse and Seedling/Hardening Off Cage Chemical Usage		
Chemical- use	Annual Usage ¹ (volume per year)	Units
Marathon ²	3.24	OZ
Sulfur ³	103.68	OZ
Copper ⁴	21.6	OZ
Manzate ⁵	21.6	OZ
Agri-mek ⁶	43.2	OZ
Rally ⁷	5.184	OZ
Success ⁸	16.2	OZ
Adept ⁹	80.352	OZ
20-20-20 ¹⁰	320	lb
Cal nitrate ¹¹	320	lb
Quintec ¹²	5.184	OZ

Greenhouse and Seedling/Hardening Off Cage Chemical Usage		
Chemical- use	Annual Usage¹ (volume per year)	Units
Orthene ¹³	10.8	OZ
Physan ¹⁴	72	OZ

- ¹ Applied chemicals per 40,000 square feet of greenhouse and seedling hardening off area. Actual amounts in waste stream depends on plant uptake (Chemicals in waste stream = Total Applied – Plant Uptake).
- ² A chloronicotinyl used as an insecticide.
- ³ In vaporized form is used as a pesticide.
- ⁴ Used to neutralize chemicals found in greenhouse water from fertilizers, pesticides, and other chemicals.
- ⁵ A dispersible granule fungicide that contains manganese, zinc, and ethylenebisdithiocarbamate.
- ⁶ A miticide/insecticide that is a mixture of avermectins.
- ⁷ A sterol inhibitor fungicide that contains myclobutanil, kaolin, calcium polysilicate, silica, and titanium dioxide.
- ⁸ An insecticide that contains 1,2-benzisothiazoline-3-one.
- ⁹ An insect growth regulator in water-soluble bags for control of soil inhabiting and foliar feeding insects.
- ¹⁰ A mixture of inorganic salts (potassium nitrate, monoammonium phosphate, diammonium phosphate, and urea) for use as a fertilizer.
- ¹¹ Used as a supplement to provide additional nutrients to the food crop.
- ¹² A protectant fungicide for control of powdery mildew on food crops.
- ¹³ An organophosphate pesticide.
- ¹⁴ A quarternary ammonium compound used as a greenhouse disinfectant and algaecide.

13. Process wastewater quality discharged to the LAAs is summarized below for select constituents.

Constituent	Average Process Wastewater, mg/l unless specified¹
BOD	868
EC, µmhos/cm	1,779
TDS	1,982
FDS	946
Chloride	164
Sodium	96
Sulfate	n/a
Nitrate - N	18
TKN	137
NH ₄ -N	57
Total Nitrogen	155

BOD denotes biochemical oxygen demand. EC denotes electrical conductivity. TDS denotes total dissolved solids. FDS denotes fixed dissolved solids. TKN denotes total kjeldahl nitrogen. NH₄-N denotes ammonia as nitrogen.

¹ Based on samples from 2005 – 2010.

14. Process wastewater flows discharged to the LAAs are summarized below:

Processing Year	Historical Annual Process Wastewater Flows		
	Annual Flow (gal/yr)	Application Rate ¹ (in/yr)	Days of Discharge
2009	436,140	5.2	94
2010	499,090	5.9	93
2011	424,590	5.0	60
2012	370,630	4.4	60
2013	375,770	4.5	55

¹ Based on 3.1 acre land application area.

15. Residual solids include fruit rinds, skins, pulp, and recovered material from wastewater screens. Residual solids are collected in bins for later application to various agricultural fields throughout the property. Designated 10-acre fields are chosen each year for spreading and disking of residual solids. The fields are rotated to a different location every year to ensure the land application of residual solids does not cause nutrient overloading, nuisance odors, or promote vector breeding. The fields are planted with crops and the crops are harvested for additional nutrient removal. Typical residual solids application rates are 1 to 2 inches over the 10-acre field. The residual solids land application area is shown on Attachment B.
16. Domestic wastewater generated at the facility is discharged to a septic system permitted by the Yolo County Environmental Health Department. The facility operates two small reverse osmosis (RO) systems, a small autoclave boiler used for sterilization, and a deionization system in the lab. Waste generated from the deionization system is disposed of offsite. The two small reverse osmosis systems are used to treat water supplied to the office and laboratory. The laboratory is used for visual and microscopic examination of plant tissues and culturing of potential plant pathogens. No chemical analyses are performed. A small boiler supplies 330 pounds per hour of steam to a small autoclave, which is used for sterilization at the facility. The autoclave is not in continuous use, and the boiler is operated only when the autoclave is in use. The reverse osmosis brine and boiler blow down are discharged to the septic system, and represent less than 5 percent of the combined flow to the domestic wastewater system.

Planned Changes in the Facility and Discharge

17. The Discharger proposes to construct five additional tomato greenhouses, two new seedling greenhouses, and a new hardening off cage. Plants will be grown and irrigated with drip emitters in the tomato and seedling greenhouses and hardening off cage on a year round basis. Water from irrigation and cleanup of these greenhouses will be collected in individual floor drains and discharged to a common collection sump. Collected drainage will be pumped to the existing 3,000-gallon wastewater holding tank located at the Southern Area, prior to discharge to the LAAs. Based on existing flows and anticipated flows from the site improvements, the Discharger requests the annual flow limit be changed from 493,000 gallons to 1,001,121 gallons.

A process flow schematic of the facility operations is shown on Attachment C, which is attached hereto and made part of this Order by reference.

18. The LAA will be expanded from 3.1 to 5.0 acres, as shown on Attachment B.
19. Based on the proposed flow limit and increased land application area, the following loading rates shown below are anticipated for the specified constituents.

Constituents/Parameter	Loading Rate
Hydraulic Loading Rate	7.4 in/yr
BOD	29 lb/ac/day (typical); 100 lb/ac/day (maximum) ¹
TDS	3,307 lb/ac/yr ²
FDS	1,578 lb/ac/yr ³
Total Nitrogen	260 lb/ac/yr ⁴

- ¹ Based on an 8-day irrigation cycle average, historical average BOD concentration of 868 mg/L, and historical loading rates.
- ² Based on historical average TDS concentration of 1,982 mg/L.
- ³ Based on historical average FDS concentration of 946 mg/L.
- ⁴ Based on an average total nitrogen concentration of 156 mg/L. Typical nutrient requirement for turf grass is 225 to 260 lb/ac/yr.

20. A water balance was included in the RWD. Based on a 100-year return period 365 day precipitation event, the water balance demonstrates that the total crop demand exceeds the amount of wastewater generated, and therefore, supplemental irrigation water is needed to sustain the crop. A total of 45 inches of water must be applied during a 100-year return period to sustain the turf grass. The proposed wastewater flow rate of 1,001,121 gallons is equivalent to 7.4 inches of water applied to the 5.0-acre LAA. Therefore, approximately 38 inches of supplemental irrigation water is needed during a 100-year return, and the blending ratio would be approximately 6:1 (supplemental water to wastewater).

The average FDS and total nitrogen wastewater concentration based on samples from 2005 to 2010 was approximately 946 mg/L and 155 mg/L, respectively. The Discharger does not anticipate fluctuations in effluent quality and considers these concentrations representative of future effluent quality. The Discharger requests a flow-weighted FDS effluent limit of 1,000 mg/L in lieu of the existing flow-weighted EC limit of 1,500 µmhos/cm and chloride limit of 200 mg/L for the combined wastewater and supplemental irrigation water. Supplemental irrigation water is better quality water than the process wastewater with respect to salts and nutrients.

21. The Discharger proposes to replace the existing domestic wastewater system (septic tank/leach field system) with a new septic tank/leach field system designed for a 1,577-gallon per day flow. The existing septic tank and leach field system is permitted by the Yolo County Environmental Health Department. Based on the design flow, the county will regulate the new septic tank and leach field system. The location of the new domestic wastewater system is shown on Attachment B.

Site-Specific Conditions

22. The facility's water supply is from an onsite well (well 7036) that is screened between 320 and 360 feet below the ground surface. A summary of the average water supply quality measured from annual samples collected between 2004 and 2010 is shown below.

Constituents	Average Supply Water Quality, mg/L unless specified
BOD	3.0
EC, μ mhos/cm	937
TDS	549
FDS	450
Chloride	56
Sodium	84
Sulfate	38
Nitrate - N	9.1
TKN	1.0
NH ₄ -N	0.2
Total Nitrogen	9.1

23. Supplemental irrigation water is supplied by an onsite irrigation well (well Northrup-King). A summary of the average supplemental irrigation water quality measured from seven sample events between August 2008 and October 2010 is shown below.

Constituents	Average Supplemental Irrigation Water Quality, mg/L unless specified
EC, μ mhos/cm	895
TDS	536
FDS	468
Chloride	54
Sodium	66
Nitrate - N	18
TKN	1.0
NH ₄ -N	0.3
Total Nitrogen	19

24. The processing facility and LAAs are located on relatively flat land and outside of the 100-year flood plain.
25. The reference evapotranspiration rate (ET₀) for the area is approximately 56 inches per year, and approximately 26 inches of the ET₀ typically occurs from July through October when the process wastewater discharge occurs.
26. The surrounding land uses are agricultural. The land to the north and east of the facility consists mainly of row crops. The facility is bounded on the west by County

Road 98 and on the south and on the east by a local drainage ditch, which drains to Willow Slough.

Groundwater Conditions

27. Soils in the area are classified by the Natural Resource Conservation Service as predominately Capay silty clay with small areas of Sycamore silty clay loam and Marvin silty clay loam. These soils are characterized as poorly drained soils with slow permeability.
28. There are no shallow groundwater monitoring wells at the site. The Discharger has land applied wastewater to the current LAAs since the 2004 processing season. The Discharger completed a limited assessment of groundwater quality beneath the LAAs in September 2006 (two years after discharge operations began) and again in August 2012. The soil borings were advanced to first encountered groundwater. Temporary wells were installed using polyvinyl chloride pipe with 5 to 10 feet sections of screen. In 2006, one groundwater sample was obtained from three temporary soil borings SB-1, SB-2, and SB-3. In 2012, soil borings SB-4, SB-5, and SB-6 were conducted in the same general area and a single groundwater sample were obtained from each boring for analysis. First encountered groundwater ranged from 17.0 to 18.5 feet below ground surface. Based on groundwater elevation contour mapping developed by the Department of Water Resources for Spring 1997, shallow groundwater is approximately 40 feet mean sea level (about 25 feet below ground surface). The temporary boring locations are shown on Attachment B. The analytical data are summarized below for select constituents.

Constituents	Potential WQO	Shallow Groundwater Quality, mg/L					
		Southwest boundary of the 1.6-ac LAAs		Southeast boundary of the 1.6-ac LAAs		North of the 1.6-ac LAAs	
		2006	2012	2006	2012	2006	2012
		SB-1	SB-4	SB-2	SB-5	SB-3	SB-6
TDS	450 ⁴ – 1,500 ³	693	564	1,055	396	1,391	1,255
FDS	--	535	531	875	375	1,164	1,178
Chloride	106 ⁴ – 600 ³	32	130	77	48	65	74
Sodium	69 ⁴	180	68	305	59	324	198
Sulfate	250 ² – 600 ³	145	35	294	27	205	296
Nitrate nitrogen	10 ¹	44	13	52	7	58	41
TKN	--	< 1.0	< 1.0	< 1.0	< 1.0	4	< 1.0
Calculated Total Nitrogen	--	44	13	52	7	62	41
Iron	0.3 ²	< 0.1	< 0.1	0.21	< 0.1	0.19	< 0.1
Manganese	0.05 ²	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

¹ Primary Maximum Contaminant Level
² Secondary Maximum Contaminant Level
³ Short-term Secondary Maximum Contaminant Level
⁴ Lowest agricultural Water Quality Goal

29. The data above indicate that groundwater beneath the LAA exceeds potential water quality objectives for total dissolved solids, chloride, sodium, sulfate, and nitrate nitrogen but that shallow groundwater quality generally improved between 2006 and 2012. The limited groundwater data do not conclusively demonstrate the source of the apparently poor shallow groundwater quality at the site. It may be naturally occurring, the result of agricultural practices or previous discharges, or some combination of the three. An unlined west-east oriented agricultural drainage ditch is located on the south side of the property. An unlined north-south oriented drainage ditch is located on the east side of the residual solids land application area. This ditch receives surface water runoff within the area, including storm water runoff and tailwater runoff from neighboring properties. Percolation from this ditch may influence the water quality of the shallow groundwater, particularly near SB-1, SB-2, SB-4, and SB-5.

Basin Plan, Beneficial Uses, and Regulatory Considerations

30. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. Pursuant to Water Code section 13263(a), waste discharge requirements must implement the Basin Plan.
31. Local drainage is to Willow Slough, which is tributary to the Yolo Bypass. The beneficial uses of the Yolo Bypass, as stated in the Basin Plan, are agricultural supply; water contact recreation; non-contact water recreation; commercial and sport fishing; aquaculture; warm freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; and wildlife habitat.
32. The beneficial uses of underlying groundwater as set forth in the Basin Plan are municipal and domestic supply, agricultural supply, industrial service supply and industrial process supply.
33. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity in groundwater. It also sets forth a numeric objective for total coliform organisms.
34. The Basin Plan's numeric water quality objective for bacteria requires that the most probable number (MPN) of coliform organisms over any seven-day period shall be less than 2.2 per 100 mL in MUN groundwater.
35. The Basin Plan's narrative water quality objectives for chemical constituents, at a minimum, require waters designated as domestic or municipal supply to meet the MCLs specified in Title 22 of the California Code of Regulations (hereafter Title 22). The Basin Plan recognizes that the Central Valley Water Board may apply limits more

stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

36. The narrative toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, animal, plant, or aquatic life associated with designated beneficial uses.
37. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses. The Basin Plan states that when compliance with a narrative objective is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective.
38. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as *Water Quality for Agriculture* by Ayers and Westcot and similar references indicate that yield reductions in nearly all crops are not evident when irrigation water has an EC less than 700 $\mu\text{mhos/cm}$. There is, however, an eight- to ten-fold range in salt tolerance for agricultural crops and the appropriate salinity values to protect agriculture in the Central Valley are considered on a case-by-case basis. It is possible to achieve full yield potential with waters having EC up to 3,000 $\mu\text{mhos/cm}$ if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.
39. With regard to BOD, excessive application can deplete oxygen in the vadose zone and lead to anoxic conditions. At the ground surface, this can result in nuisance odors and fly-breeding. When insufficient oxygen is present below the ground surface, anaerobic decay of the organic matter can create reducing conditions that convert metals that are naturally present in the soil as relatively insoluble (oxidized) forms to more soluble reduced forms. This condition can be exacerbated by acidic soils and/or acidic wastewater. If the reducing conditions do not reverse as the percolate travels down through the vadose zone, these dissolved metals (primarily iron, manganese, and arsenic) can degrade shallow groundwater quality. Many aquifers contain enough dissolved oxygen to reverse the process, but excessive BOD loading over extended periods may cause beneficial use impacts associated with these metals.
40. Typically, irrigation with high strength wastewater results in high BOD loading on the day of application. It is reasonable to expect some oxidation of BOD at the ground surface, within the evapotranspiration zone and below the root zone within the vadose (unsaturated) zone. The maximum BOD loading rate that can be applied to land without creating nuisance conditions or leaching of metals can vary significantly depending on soil conditions and operation of the land application system.
41. *Pollution Abatement in the Fruit and Vegetable Industry*, published by the United States Environmental Protection Agency, cites BOD loading rates in the range of

36 to 600 lb/acre-day to prevent nuisance, but indicates the loading rates can be even higher under certain conditions. The studies that supported this report did not evaluate actual or potential groundwater degradation associated with those rates. There are few studies that have attempted to determine maximum BOD loading rates for protection of groundwater quality. Those that have been done are not readily adapted to the varying soil, groundwater, and climate conditions that are prevalent throughout the region.

42. The California League of Food Processors' *Manual of Good Practice for Land Application of Food Processing/Rinse Water* proposes risk categories associated with particular BOD loading rate ranges as follows:
- a. Risk Category 1: (less than 50 lb/ac/day; depth to groundwater greater than 5 feet) Indistinguishable from good farming operations with good distribution important.
 - b. Risk Category 2: (less than 100 lb/ac/day; depth to groundwater greater than 5 feet) Minimal risk of unreasonable groundwater degradation with good distribution more important.
 - c. Risk Category 3: (greater than 100 lb/ac/day; depth to groundwater greater than 2 feet) Requires detailed planning and good operation with good distribution very important to prevent unreasonable degradation, as well as use of oxygen transfer design equations that consider site-specific application cycles and soil properties and special monitoring.

The *Manual of Good Practice* recommends allowing a 50 percent increase in the BOD loading rates in cases where sprinkler irrigation is used, but recommends that additional safety factors be used for sites with heavy and/or compacted soils.

43. Although it has not been subject to a scientific peer review process, the *Manual of Good Practice* provides science-based guidance for BOD loading rates that, if fully implemented, are considered a best management practice to prevent groundwater degradation due to reduced metals.
44. Although typical loading rates of about 30 lb/ac/day are anticipated, this Order sets an irrigation cycle average BOD loading rate for the LAA of 100 lb/acre/day based on historical maximum loadings. This is consistent with Risk Category 3 in the *Manual of Good Practice* for discharges using sprinkler application to land with well drained soils.

Antidegradation Analysis

45. State Water Resources Control Board Resolution 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:

- a. The degradation is consistent with the maximum benefit to the people of the state.
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses.
 - c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives, and
 - d. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.
46. Degradation of groundwater by some of the typical waste constituents associated with discharges from a seed washing facility, after effective source control, treatment, and control measures are implemented, is consistent with the maximum benefit to the people of the state. The Discharger aids in the economic prosperity of the community by direct employment of full-time and part-time personnel at the seed washing facility. The economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and provides sufficient justification for allowing the limited groundwater degradation that may occur pursuant to this Order.
47. The Discharger does not monitor groundwater at the facility. A limited groundwater assessment was performed in 2006 two years after discharge operations began, which was based on single groundwater samples from temporary soil borings. The assessment was repeated in 2012. Based on the data available, it is not possible to determine pre-1968 groundwater quality.
48. Constituents of concern that have the potential to degrade groundwater include salts (primarily TDS, sodium, and chloride), nutrients, and certain metals (iron and manganese). The limited groundwater data do not conclusively demonstrate the source of the apparently poor shallow groundwater quality at the site. It may be naturally occurring, the result of agricultural practices, the result of the previous discharges, or some combination of the three. The land discharge at the current LAAs has been ongoing since 2004 at relatively low water application rates, typically between 4 to 5 inches/year. The proposed increase of flow and expansion of the LAAs would result to a water application rate of approximately 7.4 inches/year and approximately 1.1 inches/month during the processing season months of June through October. The LAAs are cropped with turf grass that has a total water demand of approximately 45 inches/year. Supplemental irrigation water is better quality water than the process wastewater with respect to salts and nutrients. Based on the limited volume of discharge, the seasonal nature of the discharge, the character of the waste, and site-specific soil and groundwater conditions, the discharge has minimal potential to degrade groundwater quality if properly managed. Therefore, groundwater monitoring is not necessary unless the discharge changes significantly or new information regarding the threat to groundwater quality becomes available.

49. This Order establishes protective discharge requirements and includes effluent and groundwater limitations that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan.
50. The Discharger provides treatment and control of the discharge that incorporates:
 - a. Screening to reduce the BOD concentration of processing wastewater.
 - b. Approximately 5.0 acres of available LAAs for process wastewater, cropped with turf grass, which is harvested periodically during the processing season.
 - c. LAAs are separated into a number of irrigation checks irrigated with sprinklers, which minimizes the amount of water being conveyed in open ditches.
 - d. Flow control to irrigation checks are manually controlled to ensure proper uniformity of distribution across the length of the checks and to prevent release of process water from the discharge areas.
 - e. Designated 10-acre fields are chosen each year for spreading and disking of residual solids. The fields are rotated to a different location every year to ensure that the application of residual solids does not cause nutrient overloading, nuisance odors, or promote vector breeding. Planting and harvesting of crops allows nutrient removal prior to the same 10-acre area being used again for land application of solids.
 - f. Nitrogen and BOD loading rate control for the LAAs.

Other Regulatory Considerations

51. In compliance with Water Code section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
52. Based on the threat and complexity of the discharge, the facility is determined to be classified as 3C as defined below:
 - a. Category 3 threat to water quality: "Those discharges of waste that could degrade water quality without violating water quality objectives, or could cause a minor impairment of designated beneficial uses as compared with Category 1 and Category 2."
 - b. Category C complexity, defined as: "Any discharger for which waste discharge requirements have been prescribed pursuant to section 13263 of the Water Code not included in Category A or Category B as described above. Included are dischargers having no waste treatment systems or that must comply with best management practices, dischargers having passive treatment and disposal systems, or dischargers having waste storage systems with land disposal."

53. Title 27 of the California Code of Regulations (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste. However, Title 27 exempts certain activities from its provisions. Discharges regulated by this Order are exempt from Title 27 pursuant to provisions that exempt domestic sewage, wastewater, and reuse. Title 27, section 20090 states in part:

The following activities shall be exempt from the SWRCB-promulgated provisions of this subdivision, so long as the activity meets, and continues to meet, all preconditions listed:

(...)(b) Wastewater - Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leachfields if the following conditions are met:

- (1) the applicable RWQCB has issued WDRs, reclamation requirements, or waived such issuance;
- (2) the discharge is in compliance with the applicable water quality control plan; and
- (3) the wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste.

(...)(f) Soil Amendments - Use of nonhazardous decomposable waste as a soil amendment pursuant to applicable best management practices, provided that RWQCBs may issue waste discharge or reclamation requirements for such use.(...)

54. The discharge authorized herein, and the treatment and storage facilities associated with the discharge, are exempt from the requirements of Title 27 as follows:
- a. Discharges to the LAAs are exempt pursuant to Title 27, section 20090(b) because they are discharge of wastewater to land and:
 - i. The Central Valley Water Board is issuing WDRs.
 - ii. The discharge is in compliance with the Basin Plan, and;
 - iii. The wastewater does not need to be managed as hazardous waste.
 - b. Discharge of crop and food processing residual solids to the LAAs is exempt pursuant to Title 27, section 20090(b) because it constitutes use of nonhazardous decomposable waste as a soil amendment and this Order requires implementation of applicable best management practices.
55. Although the discharge is exempt from Title 27, the statistical data analysis methods of Title 27, section 20415(e) are appropriate for determining whether the discharge complies with Groundwater Limitations specified in this Order.
56. The State Water Board adopted Order 97-03-DWQ (NPDES General Permit CAS000001) specifying waste discharge requirements for discharges of storm water

associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. Based on the Standard Industrial Classification (SIC) code, the Discharger is exempt from coverage under NPDES General Permit CAS000001 per SIC code.

57. Water Code section 13267(b) states:

In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region ... shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The technical reports required by this Order and the attached Monitoring and Reporting Program R5-_____ are necessary to ensure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

58. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the state or county pursuant to Water Code section 13801, apply to all monitoring wells used to monitor the impacts of wastewater storage or disposal governed by this Order.

59. A Minor Use Permit and a Negative Declaration for the expansion of the Syngenta Woodland Seed Processing Facility was certified by Yolo County Planning and Public Works Department on 15 September 2011 in accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The Negative Declaration analyzed the expansion which includes the following:

- a. Increase in wastewater flow from the currently permitted 493,000 gallons/year to 800,000 gal/yr generated from the additional tomato and seedling greenhouses and hardening off cage.
- b. Expansion of the land application area from 1.6 acres to approximately 4.0 acres.

The Negative Declaration evaluated the potential impacts to groundwater quality and found that compliance with WDRs will ensure that impacts to water quality would be less than significant. Compliance with this Order will mitigate or avoid significant impacts to water quality.

60. The Yolo County Planning and Public Works Department issued a 7 February 2012 letter after its review of the RWD, and determined that the proposed increase in process flow to 1,001,121 gal/yr and the increase of the land application area to 5.0 acres do not present any new potentially significant impacts to groundwater quality. The letter stated that the proposed size of the land application area was increased sufficiently to accommodate the added flow and to ensure that hydraulic, organic, and nitrogen loading would be adequately maintained in order to minimize impacts to groundwater quality.
61. The action to adopt waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality (CEQA), in accordance with the California Code of Regulations, title 14, section 15301.
62. Pursuant to Water Code section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

63. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
64. The Discharger and interested agencies and persons have been notified of the Central Valley Water Board's intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity to submit written comments and an opportunity for a public hearing.
65. All comments pertaining to the discharge were heard and considered in a public hearing.

IT IS HEREBY ORDERED that Order R5-2008-0158 is rescinded, pursuant to Water Code sections 13263 and 13267, Syngenta Seeds, Inc., its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted hereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses, including irrigation ditches outside the control of the Discharger, is prohibited.
2. Discharge of waste classified as 'hazardous', as defined in the California Code of Regulations, title 23, section 2510 et seq., is prohibited.
3. Discharge of waste classified as 'designated', as defined in Water Code section 13173, in a manner that causes violation of groundwater limitations, is prohibited.

4. Treatment system bypass (including screens) of untreated or partially treated waste is prohibited, except as allowed by Standard Provision E.2 of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*.
5. Discharge of waste at a location or in a manner different from that described in the Findings is prohibited.
6. Discharge of toxic substances into the wastewater treatment system or land application areas such that biological treatment mechanisms are disrupted is prohibited.
7. Discharge of process wastewater to the domestic wastewater treatment system (septic system) is prohibited.
8. Discharge of domestic waste to anything other than septic system or regularly serviced portable toilets is prohibited.

B. Flow Limitations

1. **Effective immediately**, the maximum process wastewater flows to the land application areas shall not exceed the following limits:

Flow Measurement	Flow Limit
Total Annual Flow ¹	1,001,121 gallons

¹ As determined by the total flow for the calendar year.

C. Effluent and Mass Loading Limitations

1. Process wastewater applied to the LAAs shall not exceed the following effluent and mass loading limits:

Constituent	Units	Maximum	Annual Maximum
FDS Concentration	mg/L	--	1,000 ¹
BOD Mass Loading	lb/ac/day	100 ²	--
Total Nitrogen Mass Loading	lb/ac/year	--	Crop Demand ³

¹ Based on the flow-weighted annual average FDS concentration of the process wastewater.

² Applies as an irrigation cycle average. For the purpose of this Order, "irrigation cycle" is defined as the time period between the start of an irrigation event for a single check or field and the start of the next irrigation event for the same check or field.

³ Based on wastewater, including residual solids, commercial fertilizers, etc.

2. Compliance with the above requirements shall be determined as specified below:

- a. The flow-weighted annual average FDS concentration shall be calculated using the following formula:

$$C_a = \frac{\sum_{i=1}^{12} (C_{Pi} \cdot V_{Pi})}{\sum_{i=1}^{12} (V_{Pi})}$$

- Where: C_a = Flow-weighted annual average FDS concentration in mg/L
 i = the number of the month (e.g., January = 1, February = 2, etc.)
 C_{Pi} = Monthly average process wastewater FDS concentration for calendar month i in mg/L
 V_{Pi} = volume of process wastewater applied to the LAAs during calendar month i in million gallons

- b. The mass of BOD applied to each LAA check or field as an irrigation cycle average shall be calculated using the following formula:

$$M = \frac{8.345(CV)}{A(CT)}$$

- Where: M = mass of BOD applied to a LAA check or field in lb/ac/day/irrigation cycle
 C = concentration of BOD in mg/L based on most recent monitoring result
 V = volume of wastewater applied to a LAA check or field in millions of gallons per day during the cycle
 A = area of the LAA check or field irrigated in acres
 CT = Cycle time (i.e., irrigation cycle length)
 8.345 = unit conversion factor

- c. The mass of total nitrogen applied to each LAA check or field on an annual basis shall be calculated using the following formula and compared to published crop demand for the crops actually grown:

$$M = \sum_{i=1}^{12} \frac{(8.345(C_i V_i) + M_x)}{A}$$

- Where: M = mass of nitrogen applied to each LAA check or field in lb/ac/yr
 C_i = monthly average concentration of total nitrogen for month i in mg/L
 V_i = volume of wastewater applied to each LAA check or field during calendar month i in million gallons
 A = area of the LAA irrigated in acres
 i = the number of the month (e.g., January = 1, February = 2, etc.)
 M_x = nitrogen mass from other sources (e.g., fertilizer and residual solids) in pounds
8.345 = unit conversion factor

D. Discharge Specifications

1. No waste constituent shall be released, discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations of this Order.
2. The discharge shall not cause degradation of any water supply.
3. Wastewater treatment, storage, and disposal shall not cause pollution or a nuisance as defined by Water Code section 13050.
4. The discharge shall remain within the permitted waste treatment/containment structures and land application areas at all times.
5. The Discharger shall operate all systems and equipment to optimize the quality of the discharge.
6. All conveyance, treatment, storage, and disposal systems shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
7. Objectionable odors shall not be perceivable beyond the limits of the property where the waste is generated, treated, and/or discharged at an intensity that creates or threatens to create nuisance conditions.

8. All open waste containment structures shall be managed to prevent breeding of mosquitoes. Specifically:
 - a. An erosion control program shall be implemented to ensure that small coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface.
 - d. The Discharger shall consult and coordinate with the local Mosquito Abatement District to minimize the potential for mosquito breeding as needed to supplement the above measures.

9. Storage of residual solids from crop and food processing operations on areas not equipped with means to prevent storm water infiltration, or a paved leachate collection system is prohibited.

E. Groundwater Limitations

Release of waste constituents from any portion of the facility shall not cause groundwater to:

1. For constituents identified in Title 22, contain constituents in concentrations that exceed either the Primary or Secondary MCLs established therein.
2. Contain taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

F. Wastewater Land Application Area Specifications

1. Crops and vegetation shall be grown in the LAAs and periodically removed/harvested.
2. Land application of wastewater shall be managed to minimize erosion.
3. The LAAs shall be managed to prevent breeding of mosquitoes. In particular:
 - a. There shall be no standing water 48 hours after irrigation ceases;
 - b. Tailwater ditches shall be maintained essentially free of emergent, marginal, and floating vegetation; and
 - c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store recycled water.

4. LAAs shall be designed, maintained, and operated to comply with the following setback requirements:

Setback Definition	Minimum Irrigation Setback (feet)
Edge of LAA to public right of ways	25
Edge of LAA to manmade or natural surface water drainage course	25
Edge of LAA to domestic water supply well	100

5. Irrigation of the LAAs shall occur only when appropriately trained personnel are on duty.
6. LAAs shall be inspected as frequently as necessary to ensure continuous compliance with the requirements of this Order.
7. Spray irrigation with wastewater is prohibited when wind speed (including gusts) exceeds 30 mph.
8. Sprinkler heads shall be designed, operated and maintained to create a minimum amount of mist.
9. Any irrigation runoff (tailwater) shall be confined to the LAAs or returned to the holding tanks and shall not enter any surface water drainage course or storm water drainage system.
10. Discharge of process wastewater to the LAAs shall not be performed during rainfall or when the ground is saturated.
11. At the end of each processing season and no later than **15 November** each year, the concrete pads, sumps, and collection lines shall be thoroughly flushed with fresh water prior to allowing storm water runoff to an adjacent agricultural ditch without entering the holding tanks.
12. Between **15 November and 1 May**, discharge of storm water runoff from the LAAs to off-site land or surface water drainage courses is allowed.

G. Processing Residual Solids Disposal and Land Application Specifications

Sludge, as used in this document, means the solid, semisolid, and liquid organic matter removed from wastewater treatment, settling, and storage vessels or ponds. Solid waste refers to solid inorganic matter removed by screens and soil sediments from washing of unprocessed fruit or vegetables. Except for waste solids originating from meat processing, residual solids means organic food processing byproducts such as

culls, pulp, stems, leaves, and seeds that will not be subject to treatment prior to disposal or land application.

1. Sludge and solid waste shall be removed from screens, sumps, and tanks as needed to ensure optimal operation and adequate storage capacity.
2. Any handling and storage of sludge, solid waste, and residual solids shall be controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate the groundwater limitations of this Order.
3. If removed from the site, sludge, solid waste, and residual solids shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27, division 2. Removal for reuse as animal feed, or land disposal at facilities (i.e., landfills, composting facilities, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a Regional Water Board will satisfy this specification.
4. Any proposed change in solids use or disposal practice shall be reported in writing to the Executive Officer at least 90 days in advance of the change.
5. Residual solids shall be applied to a designated land application area field each year. The designated field shall be rotated to a different location every year, returning to the original located after approximately six years.
6. Residual solids shall be applied at agronomic rates for nutrients, and the application rate shall be selected to prevent vector attraction and nuisance odors.
7. Residual solids shall be evenly applied and incorporated into the soil by disking as necessary to prevent nuisance conditions.
8. Crops and vegetation shall be grown and harvested in the designated field.
9. The total nitrogen loading to each designated field shall not exceed the agronomic rate for the type of crop grown.

H. Provisions

1. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Central Valley Water Board by **31 January**.

2. In accordance with California Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall bear the professional's signature and stamp.
3. The Discharger shall submit the technical reports and work plans required by this Order for consideration by the Executive Officer, and incorporate comments the Executive Officer may have in a timely manner, as appropriate. Unless expressly stated otherwise in this Order, the Discharger shall proceed with all work required by the foregoing provisions by the due dates specified.
4. The Discharger shall comply with Monitoring and Reporting Program R5-_____, which is part of this Order, and any revisions thereto as ordered by the Executive Officer. The submittal dates of Discharger self-monitoring reports shall be no later than the submittal date specified in the MRP.
5. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and made part of this Order by reference. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."
6. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports. On or before each report due date, the Discharger shall submit the specified document to the Central Valley Water Board or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharger shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board in writing when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.
7. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger

when the operation is necessary to achieve compliance with the conditions of this Order.

8. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.
9. As described in the Standard Provisions, the Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.
10. The Discharger shall report to the Central Valley Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986."
11. The Discharger shall not allow pollutant-free wastewater to be discharged into the wastewater collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.
12. At least **90 days** prior to termination or expiration of any lease, contract, or agreement involving disposal or recycling areas or off-site reuse of effluent, used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Central Valley Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.
13. In the event of any change in control or ownership of the facility, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.
14. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

15. A copy of this Order including the MRP, Information Sheet, Attachments, and Standard Provisions, shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
16. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order or with the WDRs may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full true, and correct copy of an Order adopted by the California Regional Water Quality Control Board on _____.

PAMELA C. CREEDON, Executive Officer