INFORMATION SHEET

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SYNGENTA SEEDS, INC.
WOODLAND SEED PROCESSING FACILITY
YOLO COUNTY

Facility Description

Syngenta Seeds, Inc. owns and operates a commercial seed operation facility at 21435 County Road 98, approximately 1.5 miles south of the City of Woodland. 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. WDRs Order R5-2008-0158 prescribes requirements for the discharge of process wastewater to approximately 3.1 acres of land application area (LAA).

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 from the greenhouse evaporative cooler temperature control systems drainage.

The combined process and greenhouse wastewater is collected in a 3,000-gallon holding tank prior to application to the LAA, which is cropped with turf grass. Typical wastewater application rates range from 4.4 to 5.9 inches per year (in/yr). The LAA is divided into several checks. Wastewater is applied by sprinkler irrigation. Manual valves are used to control the flow to each check. Supplemental fresh water is added as needed. The grass is periodically harvested each season.

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. The fields are planted with crops, which are harvested. Typical residual solids application rates are 1 to 2 inches over a 10-acre field.

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. No chemical analyses are performed in the laboratory. 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

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 the existing 3,000-gallon wastewater holding tank, prior to discharge to the LAAs. The Discharger requests the annual flow limit be changed from 493,000 to 1,001,121 gallons and proposes to expand the wastewater LAAs from 3.1 to 5.0 acres.

Based on the proposed flow limit and increased LAAs, 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.

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 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 is 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.

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.

Site-Specific Conditions

The facility's water supply is from an onsite well (well 7036) that is screened between 320 and 360 feet below the ground surface. The water supply is fairly good quality water with respect to salinity constituents and nitrate.

Supplemental irrigation water is supplied by an onsite irrigation well (well Northrup-King). Salinity constituent concentrations in the irrigation water are similar to the water supply quality. However, the average nitrate concentration in the irrigation water exceeds 10 mg/L, the secondary MCL for nitrate.

The processing facility and LAAs are located on relatively flat land and outside of the 100-year flood plain. The reference evapotranspiration rate for the area is approximately 56 in/yr. 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

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.

There are no shallow groundwater monitoring wells at the site. Wastewater has been applied to the current LAAs since the 2004 processing season. A limited assessment of the groundwater quality beneath the LAAs was conducted in September 2006 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).

Based on the two monitoring events, groundwater beneath the LAA exceeds potential water quality objectives for total dissolved solids, chloride, sodium, sulfate, and nitrate nitrogen but 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

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, and contains implementation plans and policies for protecting waters of the basin. 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. 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.

Antidegradation Analysis

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:

- The degradation is consistent with the maximum benefit to the people of the state.
- The degradation will not unreasonably affect present and anticipated future beneficial uses.
- 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
- The discharger employs best practicable treatment or control (BPTC) to minimize degradation.

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.

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.

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 in/yr. The proposed increase of flow and expansion of the LAAs would result to a water application rate of approximately 7.4 in/yr and approximately 1.1 inches per 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 in/yr. 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 the 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.

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.

The Discharger provides treatment and control of the discharge that incorporates:

- Screening to reduce the BOD concentration of processing wastewater.
- Approximately 5.0 acres of available LAAs for process wastewater, cropped with turf grass, which is harvested periodically during the processing season.
- LAAs are separated into a number of irrigation checks irrigated with sprinklers, which minimize the amount of water being conveyed in open ditches.
- 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.
- 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.

- Nitrogen and BOD loading rate control for the LAAs.

Flow Limitations

Effectively 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.

Effluent and Mass Loading Limitations

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.

Groundwater Limitations

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

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