Fact Sheet for State Waste Discharge Permit No. ST0045510

National Food Corporation
Hilltop Farms

Public Notice of Draft Date: October 16, 2019

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed State Waste Discharge Permit for National Food Corporation Hilltop Farms (Hilltop Farms) that will allow discharge of wastewater to an on-site Class V underground injection control structure (drain field).

State law requires any industrial facility to obtain a permit before discharging waste or chemicals to waters of the state, which includes groundwater.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for Hilltop Farms, State Waste Discharge Permit No. ST0045510, are available for public review and comment from October 16, 2019, until the close of business November 15, 2019. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement Information**.

National Food Corporation reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions about the facility's location, history, product type or production rate, discharges or receiving water prior to publishing this draft fact sheet for public notice.

After the public comment period closes, Ecology will summarize substantive comments and our responses to them. Ecology will include our summary and responses to comments to this fact sheet as **Appendix E - Response to Comments**, and publish it when we issue the final State Waste Discharge Permit. Ecology will not revise the rest of the fact sheet, but the full document including all appendices will become part of the legal history contained in the facility's permit file.

Summary

The National Food Corporation's Hilltop Farm egg production plant processes shell eggs (unbroken eggs) for sale and delivery to wholesale clients. Eggs are washed, candled, sorted, and packaged on-site. The facility generates approximately 3,000 gallons per day (gpd) with a potential of an additional 3,000 gpd (6,000 gpd total) of wastewater from the egg washing and rinsing operation. This wastewater, along with water from floor washing of the egg washing line, is discharged to a dedicated on-site treatment system. Treated wastewater is disposed of on-site via a low-pressure drain field.

Table of Contents

List of Tables

List of Figures

I. Introduction

The Legislature defined Ecology's authority and obligations for the Wastewater Discharge Permit Program in the Water Pollution Control law, chapter 90.48 RCW (Revised Code of Washington).

Ecology adopted rules describing how it exercises its authority:

- State waste discharge program (chapter 173-216 WAC).
- Water quality standards for ground waters of the state of Washington (chapter 173-200 WAC).
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC).

These rules require any industrial facility owner/operator to obtain a State Waste Discharge Permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.

Under the State Waste Discharge Permit Program and in response to a complete and accepted permit application, Ecology generally prepares a draft permit and accompanying fact sheet, and makes it available for public review before final issuance. If the volume of the discharge has not changed or if the characteristics of the discharge have not changed, Ecology may choose not to issue a public notice. When Ecology publishes an announcement (public notice), it tells people where they can read the draft permit, and where to send their comments, during a period of thirty days. (See **Appendix A - Public Involvement Information** for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft State Waste Discharge Permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in **Appendix E**.

II. Background Information

Table 1. General Facility Information

Facility Information	
Applicant	National Food Corporation
Facility Name and Address	Hilltop Farms 2005 – 268th Street NW Stanwood, WA 98292
Contact at Facility	Name: Jim Younger Telephone #: 425-407-6278
Responsible Official	Name: Jim Younger Title: Facilities Manager Address: 16900 51st Ave NE Arlington, WA 98223 Telephone #: 425-407-6278 FAX # 425-407-6378
Industry Type	Egg Processing
Type of Treatment	Dissolved air floatation membrane bio-reactor filtration and aeration-bag filter-sand filter.
SIC Codes	5144
NAIC Codes	424440

Facility Information	
Facility Location	Latitude: 48.240588 Longitude: -122.259089
Legal Description of Application Area	Section, township, range SE ¼, SE ¼, SW ¼, Section 23, T 32 N, R 4 E Latitude: 48.2398 Longitude: -122.26067

Permit Status	
Issuance Date of Permit	
Application Submittal Date	August 15, 2011
Date of Ecology Acceptance of Application	December 22, 2011

Inspection Status	
Date of Last Non-sampling Inspection Date	July 20, 2017

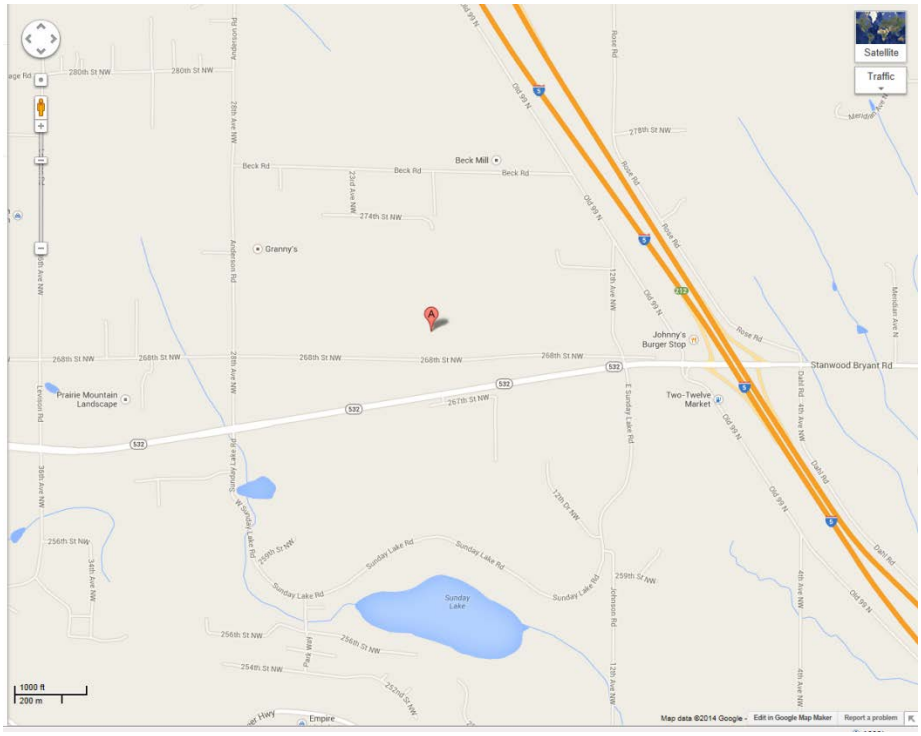

Figure 1. Facility Location Map

Figure 2. Facility Map

A. Facility description

History

The National Food Corporation's Hilltop Farm egg production plant is located in Snohomish County at 2005 268th Street NW in Stanwood, WA. The site consists of two parcels with a combined area of 78.6 acres. This facility processes shell eggs (unbroken eggs) for sale and delivery to wholesale clients. Eggs are washed, candled, sorted, and packaged on-site.

Industrial process(es)

The Hilltop Farm's egg processing plant has a single egg processing line where shell eggs (unbroken eggs) are washed, candled, sorted, and packaged for sale, and delivered to National Food Corporation's wholesale clients.

"Raw materials" at this site consist of shell eggs. Eggs are transported by conveyor belts from enclosed laying barns to a central processing building located at the southeast corner of the barns (see Figure 2). At any given time there are approximately 700,000 laying hens on site. In the processing room the eggs are washed, candled, sorted, weighed, and packaged for delivery. "Products" are the washed and packaged shell eggs. Eggs are packaged in half-dozen and dozen cartons, and four dozen flats.

The first step in processing is for the eggs to be separated into rows. This is accomplished as eggs roll off the belt conveyor from the laying barns onto a second conveyor with equally spaced pockets. The eggs then pass through an egg-washer where residue is cleaned from whole eggs and broken eggs and shells are removed. This machine is the single largest contributor to the wastewater system. Broken eggs and shells drop onto a conveyor below the egg washer that moves them to the inedible area, where eggshells and egg contents are separated into barrels. Egg contents are shipped off-site to a digester, while eggshells are reduced to powder and mixed with the chicken manure for use on local farm fields. The floor in the processing/packing area is sloped to a single trench drain that runs the length of the area parallel to the egg wash/egg lighting/weighing line. This drain discharges to the 3,000-gallon cooling/collection tank.

Eggs move from the egg-washer and pass over a high-intensity light where "blood eggs" (eggs containing any blood spots) are removed by hand. "Blood eggs" are fed to a conveyor that transports them to the inedible area for processing. The approved eggs then move past a set of six cameras linked to a computer. The cameras are looking for eggs with any anomalies (material on the shell, etc.). The computer operates a system that removes the suspect egg from the line and places it on a conveyor that goes back to the beginning of the cleaning process. Acceptable eggs then pass over a scale, where they are weighed, and enter the distribution conveyor.

The distribution conveyor is a belt with two rows of "clamps" that grasp the eggs. As the eggs move down the line, they pass a series of photocells that tell the clamp when to release the egg. The eggs are "caught" between two counter-rotating brushes that place the egg in one-of-six slots. As the slots are filled, the eggs move out the rear of the machine to the loading area, where they are placed in the appropriate containers (either half-dozen or one-dozen cartons, or four-dozen flats). This facility processes between 1.2 and 1.4 million eggs per day.

The filled cartons move to the front of the machine where workers hand load them into boxes for shipping. Boxed eggs then move by conveyor to the loading area. In the loading area egg boxes are placed on pallets and wrapped for shipment to markets around the region and internationally. Palletized egg boxes are then moved into the cooler building. This is located to the west of the processing building (see Figure 2). From the cooler, palletized egg boxes are loaded into refrigerated tractor-trailers for delivery.

Besides egg washing, the only other waste stream at the site is minor amounts of wastewater produced by clean-up activities (e.g., floor washing). This also discharges to the 3,000-gallon cooling/collection tank.

The facility operates 10 hours per day, 7 days per week, 52 weeks per year, for a total operational time of 3,640 hours per year.

Various chemicals are stored on-site, all related to egg washing or sanitizing equipment. Cleaning products include the following: AC-30-E and BEVRO-SHEEN; QUADEX-100, -200, -400, -500, -600, 700, and -800; QUORUM PINK II; QUORUM RED II; and QUORUM YELLOW II. Sanitizers include the following: ECO-WIPE-FCS; MIKROKLENE DF; STER-BAC; VORTEXX; and WHISPER V. Other chemicals include the following: SUPER KLEEN-SHEL LF, a food additive; ECOCARE 250, a skin antiseptic; ECOCARE 360, a hand sanitizer; and DEFOAMER FG, a defoamer. Cleaning and other chemicals are stored in 55-gallon plastic drums, 10-gallon carboys, or 5-gallon pails, all in compatible containment.

The facility utilizes several best management practices to control both wastewater and storm water. Management practices include the following: spill prevention and containment, overhead coverage (roofed areas), and vegetation management.

The facility generates approximately 4,600 gallons per day (gpd) (1.46 million gallons per year) of wastewater from the egg washing and rinsing operation. The facility is expanding their treatment capabilities and drain field to manage a proposed 6,000 gpd of wastewater. This wastewater, along with water from floor washing of the egg processing area, is discharged to a dedicated on-site treatment system. Treated wastewater is disposed of on-site via a low-pressure drain field.

Wastewater treatment processes (prior to land treatment)

The wastewater treatment system consists of one 3,000-gallon (gal) tank for cooling, a dissolved air floatation (DAF) tank for fat and protein removal (this tank is also used for pH adjustment), two 3,000-gal pre-aeration tanks, two 3,000-gal anaerobic clarifiers, six 3,000-gal aeration and ultra-filtration tanks, one 1,750-gal treated water collection and distribution sump, and one 3,000-square foot pressurized (low-pressure) distribution drain field. A second 4,000 gpd low-pressure drain field is being installed. All but the DAF tank are buried.

Wastewater is transferred from the floor drain collection sump in the egg processing building through a 2-inch PVC line to a holding tank. Process wastewater has a high pH, running between 9 and 12. Wastewater is gravity fed to a buried pH balance tank where acid is injected. This tank is circulated until the pH reaches acceptable levels (7 to 8). Once the appropriate pH is reached, the pH-adjusted wastewater is pumped to the first dissolved air floatation (DAF) tank (see Appendix D for a flow diagram). The DAF removes fats and proteins associated with broken eggs. The floated scum is discharged to a buried sludge tank just outside the building. This tank is periodically emptied, and the contents shipped off-site for disposal. The DAF-treated wastewater then flows to one of two 1,500-gallon holding tanks that feed the first of two membrane bioreactors (MBRs). The wastewater is treated through a series of two MBRs before going to a second DAF for polishing. Both MBRs are plumbed to a 12,000-gallon emergency overflow tank. Polished wastewater from the 2nd DAF unit is then aerated. Aeration is done in a 3,000-gallon in-ground pre-aeration tank containing a Lixor 2.0 aeration unit.

The water then moves by gravity to one of two in-ground anaerobic clarifiers for the primary digestion of organic solids. Wastewater from the two clarifiers then passes through an in-ground clean effluent tank. Water from the clean effluent tank is pumped into two #2 bag filters. The bag filters each discharge to a sand filter. Filtered wastewater from the sand filters is collected in a buried collection sump that discharges it to one of the adjacent drain fields. All tanks in this system are buried and have level alarms. Backwash from the sand filters is pumped to a separate storage tank and disposed of at a local digester.

The facility maintains multiple 5,000-gallon tank trailers to haul wastewater if there are any system problems or if more than 6,000 gpd is generated. One trailer is always staged at the treatment site ready for use.

Land treatment and distribution system (drain field)

Treated wastewater from the six aeration/filtration tanks is then discharged to a final buried collection sump for discharge to one of two drain fields. The drain fields are operated at a rate of one gallon per day per square foot. Discharge to the drain fields is alternated to allow drying time. Wastewater discharged to the drain fields is tested at an on-site lab for BOD, TSS, and pH.

Surface soils in the vicinity of the facility are mapped by the NRCS as Tokul gravelly loam. An elongated area along the western margin of the facility is mapped as Terric Medisaprists. On-site investigations showed 2.0 to 2.7 feet of topsoil overlying the Vashon lodgment till. Because of the low permeability of the till, it is likely that a shallow interflow zone forms during the late winter/early spring period on top of the till.

The majority of the facility is gravel or bare ground so storm water normally infiltrates on-site. Storm water from the roofs and impervious parking areas are collected in catch basins that feed into a central wet well. From the wet well, the storm water is pumped to a vegetated infiltration pond located to the southeast of the facility. Water enters at the north end where a flow splitter/weir distributes the flow across the bottom of the pond. Storm water moves south through the vegetated pond. Storm water that is not infiltrated is discharged through a pipe to the roadside ditch along the north side of 268th Street. The storm water system was designed to Snohomish County specifications. Facility personnel have only observed water present throughout the length of the pond during times of heavy precipitation.

Solid wastes

Aside from common municipal-type trash, the only other solid wastes generated are inedible material and chicken manure. Manure from the enclosed laying barns is collected and sold as fertilizer. Manure is transferred by conveyor belt from the laying barns directly to an enclosed accumulation area within the laying barns. From this area the manure is loaded directly on trucks by covered conveyors for transport as product to purchasers. All manure is transported off-site daily, thus no manure is stored or disposed of on-site. Drums of inedible material (broken eggs and shells) from the processing area are processed in a covered area on the east side of the processing building. Eggshells are reduced to powder and mixed with the manure for use on local farm fields. Egg contents are pumped into a covered tank. This tank is emptied weekly and the contents are taken to a digester for disposal.

B. Description of the groundwater

A hydrogeologic site assessment was performed for National Food Corporation at this site in 2011. This report notes that all water wells within ¼-mile of the site, as well as those on-site, are completed in the regional aquifer, which occurs below the till. The report further concludes that discharge to the drain field, located above the till, is not likely to have any adverse effect on the regional aquifer. It does note that an optimal location for monitoring the interflow zone is to the west of the drain field.

A single limited groundwater analysis was also performed in 2011 with the following results.

Table 2. Groundwater Characterization

Parameter	Units	# of Samples	Maximum Value
Total Dissolved Solids (TDS)	mg/L	1	160
Total Organic Carbon (TOC)	mg/L	1	4.23
Calcium	mg/L	1	11.0
Iron	mg/L	1	3.1
Magnesium	mg/L	1	3.1
Hardness	mg/L as $CaCO_3$	1	71
pH	S.U.	1	6.7

Ecology has determined that it should issue a State Waste Discharge Permit and not a National Pollutant Discharge Elimination System (NPDES) permit for this site because there is no evidence of the groundwater being in hydraulic continuity with surface water. The nearest surface water is almost 3,000 feet to the east of the facility.

C. Wastewater characterization

National Food Corporation reported the concentration of pollutants in the discharge in the permit application. The tabulated data represents the quality of the wastewater discharged in June 2011. The treated wastewater prior to infiltration is characterized as follows:

Table 3. Wastewater Characterization

Parameter	Units	# of Analyses	Average Value	Maximum Value
Biochemical Oxygen Demand (BOD_5)	mg/L	2	69	133
Chemical Oxygen Demand (COD)	mg/L	2	235	311
Total Suspended Solids (TSS)	mg/L	2	16.5	31
Total Dissolved Solids (TDS)	mg/L	2	1,575	1,860
Conductivity	µmohs/cm	2	1,551	3,100
Ammonia-N	mg/L	2	78	98
Fecal Coliform	CFU/100 mL	1	< 2	< 2

Parameter	Units	# of Analyses	Minimum Value	Maximum Value
pH	standard units	1	7.47	7.47

D. State environmental policy act (SEPA) compliance

State law exempts the issuance, reissuance, or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applies only to existing discharges, not to new discharges. SEPA does not apply in this case as it is for an existing discharge, although it is being newly permitted.

III. Proposed Permit Limits

State regulations require that Ecology base limits in a State Waste Discharge Permit on the:

- Technology and treatment methods available to treat specific pollutants (technology-based). Dischargers must treat wastewater using all known, available, reasonable methods of prevention, control, and treatment (AKART). Ecology has developed guidance describing technology-based (AKART) criteria for industrial/commercial systems that discharge to ground (Ecology, 1993; 2004).
- Operations and best management practices necessary to meet applicable water quality standards to preserve or protect existing and future beneficial uses of the groundwater.
- Groundwater quality standards (Ecology, 1996).
- Applicable requirements of other local, state and federal laws.

Ecology applies the most stringent of technology and water quality-based limits to each parameter of concern and further describes the proposed limits below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, monitoring, and irrigation/crop management). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, and are not listed in regulation.

Ecology does not usually develop permit limits for pollutants not reported in the permit application but that may be present in the discharge. The permit does not authorize the discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent. Until Ecology modifies the permit to reflect additional discharges of pollutants, a permitted facility could be violating its permit.

A. Technology-based effluent limits

Waste discharge permits issued by Ecology specify conditions requiring the facility to use AKART before discharging to waters of the state (RCW 90.48).

Wastewater treatment (prior to land treatment) requirements

Hilltop Farm must continue to maintain and operate their existing treatment system.

The proposed limits are based on that achievable through basic technology treatment for the constituents listed. Flow is based on that stated in the permit application.

Table 4. Technology-Based Effluent Limits

Effluent Limits			
Parameter	**Average Monthly**	**Maximum Daily**	**Units**
Flow	93,000	3,000	gpd
Oil & Grease	10	15	mg/L
	Monthly Geometric Mean	**7-day Geometric Mean**	**Units**
Fecal Coliform	200	400	CFU/100 mL [a]
	Daily Minimum	**Daily Maximum**	**Units**
pH	6.0	9.0	SU
[a]	CFU/100 mL ≡ Colony forming unit per 100 milliliters (of wastewater).		

Land treatment requirements

Hilltop Farm must meet the technology-based limits for effluent discharged to the drain field listed in 40 CFR 412 Subpart D. In addition, they must conduct the following to satisfy the requirement for AKART:

- Apply wastewater so as not to exceed groundwater quality standards for total nitrogen and total dissolved solids. Wastewater application rates for other wastewater constituents must protect the background groundwater quality.
- Operate the system to protect the existing and future beneficial uses of the groundwater and not cause a violation of the groundwater standards.

C. Groundwater quality-based effluent limits

In order to protect existing water quality and preserve the designated beneficial uses of Washington's groundwater including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the groundwater quality standards. The goal of the groundwater quality standards is to maintain the highest quality of the State's groundwater and to protect existing and future beneficial uses of the groundwater through the reduction or elimination of the discharge of contaminants to groundwater [WAC 173-200-010(4)]. Ecology achieves this goal by:

- Applying all known available and reasonable methods of prevention, control and treatment (AKART) to any discharge.
- Applying the antidegradation policy of the groundwater standards.
- Establishing numeric and narrative criteria for the protection of human health and the environment in the groundwater quality standards.

Antidegradation policy

The state of Washington's ground water quality standards (GWQS) require preservation of existing and future beneficial uses of groundwater through the antidegradation policy, which includes the two concepts of antidegradation and non-degradation. Antidegradation is not the same as non-degradation (see below).

Antidegradation

Antidegradation applies to calculation of permit limits in groundwater when background (see below) contaminant concentrations are less than criteria in the GWQS. Ecology has discretion to allow the concentrations of contaminants at the point of compliance to exceed background concentrations but not exceed criteria in the GWQS. Ecology grants discretion through an approved AKART engineering analysis of treatment alternatives. If the preferred treatment alternative predicts that discharges to groundwater will result in contaminant concentrations that fall between background concentrations and the criteria, then the preferred treatment alternative should protect beneficial uses and meet the antidegradation policy. In this case, the predicted concentrations become the permit limits. If the preferred alternative will meet background contaminant concentrations, background concentrations become the permit limits. Permit limits must protect groundwater quality by preventing degradation beyond the GWQS criteria. If discharges will result in exceedance of the criteria, facilities must apply additional treatment before Ecology can permit the discharge.

Non-degradation

Non-degradation applies to permit limits in groundwater when background contaminant concentrations exceed criteria in the GWQS. Non-degradation means that discharges to groundwater must not further degrade existing water quality. In this case, Ecology considers the background concentrations as the water quality criteria and imposes the criteria as permit limits. To meet the antidegradation policy, the facility must prepare an AKART engineering analysis that demonstrates that discharges to groundwater will not result in increasing background concentrations. Ecology must review and approve the AKART engineering analysis.

You can obtain more information on antidegradation and non-degradation by referring to the *Implementation Guidance for the Ground Water Quality Standards (Implementation Guidance)*, Ecology Publication #96-02 (available at https://fortress.wa.gov/ecy/publications/documents/9602.html).

Background water quality

Background water quality is determined by a statistical calculation of contaminant concentrations without the impacts of the proposed activity. The calculation requires an adequate amount of groundwater quality data and determining the mean and standard deviation of the data, as described in the *Implementation Guidance*. Following the procedure in the *Implementation Guidance,* Ecology then defines background water quality for most contaminants as the 95 percent upper tolerance limit. This means that Ecology is 95 percent confident that 95 percent of future measurements will be less than the upper tolerance limit. There are a few exceptions to the use of the upper tolerance limit. For pH, Ecology will calculate both an upper and a lower tolerance limit resulting in an upper and lower bound to the background water quality. If dissolved oxygen is of interest, Ecology will calculate a lower tolerance limit without an upper tolerance limit.

Applicable groundwater criteria as defined in chapter 173-200 WAC and in RCW 90.48.520 for this discharge include those in the following table:

Table 5. Groundwater Quality Criteria

Parameter	Units	Groundwater Criteria	Background Value
Total Coliform	colonies/ 100 mL	1	TBD [a]
Total Dissolved Solids	mg/L	500	TBD
Chloride	mg/L	250	TBD
Sulfate	mg/L	250	TBD
Nitrate (as nitrogen)	mg/L	10	TBD
pH (Maximum / Minimum)	standard units	6.5 to 8.5	TBD
Manganese	mg/L	0.05	TBD
Total Iron	mg/L	0.3	TBD
Toxics		No toxics in toxic amounts	TBD

[a] TBD ≡ To Be Determined. The proposed permit includes a compliance schedule to establish background groundwater quality.

Ecology has reviewed existing records for the facility's land treatment site and is unable to determine background groundwater quality. The proposed permit includes a compliance schedule to establish the up gradient (background) quality of the groundwater. Until Ecology establishes background water quality, the facility must operate within the approved design parameters and comply with all conditions in the permit.

IV. Monitoring Requirements

Ecology requires monitoring, recording, and reporting (WAC 173-216-110) to verify that the treatment process functions correctly, the discharge meets groundwater criteria and that the discharge complies with the permit's effluent limits.

If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the methods and meets or exceeds the method detection levels required by the permit. The permit describes when facilities may use alternative methods. It also describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

A. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters).

B. Land applied wastewater monitoring

Ecology details the proposed monitoring schedule under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

C. Vadose zone monitoring

Ecology details the proposed monitoring schedule under Special Condition S2. Ecology has determined that this discharge has a potential to pollute the groundwater, and therefore is requiring vadose zone monitoring at the site. Ecology considers monitoring of the vadose zone at the site boundaries and within the site an integral component of such an evaluation.

Ecology details the proposed monitoring schedule under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

D. Effluent limits which are near detection or quantitation levels

Water quality-based effluent concentration limits near the limits of current analytical methods to detect or accurately quantify. The method detection level (MDL) also known as detection level (DL) is the minimum concentration of a pollutant that a laboratory can measure and report with a 99 percent confidence that its concentration is greater than zero (as determined by a specific laboratory method). The quantitation level (QL) is the level at which a laboratory can reliably report concentrations with a specified level of error. Estimated concentrations are the values between the DL and the QL. Ecology requires permitted facilities to report estimated concentrations. When reporting maximum daily effluent concentrations, Ecology requires the facility to report "less than X" where X is the required detection level if the measured effluent concentration falls below the detection level.

V. Other Permit Conditions

A. Reporting and record keeping

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-216-110).

B. Operations and maintenance

Ecology requires dischargers to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state regulations (WAC 173-240-080 and WAC 173-216-110). The facility must prepare and submit of an operation and maintenance (O&M) manual for the wastewater facility. If existing standard operating procedures (SOPs), preventative maintenance programs (PMPs), etc. cover the wastewater facility and meet the substantive requirements of Special Condition S4 they can be submitted to Ecology in lieu of a dedicated O&M manual.

Implementation of the procedures in the operation and maintenance manual or other documents ensures the facility's compliance with the terms and limits in the permit and ensures the facility provides AKART to the waste stream.

C. Solid waste control plan

Hilltop Farm could cause pollution of the waters of the state through inappropriate disposal of solid waste or through the release of leachate from solid waste.

This proposed permit requires this facility to develop a solid waste control plan to prevent solid waste from causing pollution of waters of the state. The facility must submit the plan to Ecology for approval (RCW 90.48.080). You can obtain an Ecology guidance document, which describes how to develop a solid waste control plan, at: https://fortress.wa.gov/ecy/publications/documents/0710024.pdf . If existing documents (SOPs, PMPs, etc.) cover the handling of solid waste and meet the substantive requirements of Special Condition S5 they can be submitted to Ecology in lieu of a dedicated solid waste control plan.

D. Non-routine and unanticipated discharges

Occasionally, this facility may generate wastewater that was not characterized in the permit application because it is not a routine discharge and was not anticipated at the time of application. These wastes typically consist of waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems.

The permit authorizes non-routine and unanticipated discharges under certain conditions specified in Special Condition S7. The facility must characterize these wastewaters for pollutants and examine the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and on any opportunities for reuse, Ecology may:

- Authorize the facility to discharge the wastewater.
- Require the facility to treat the wastewater.
- Require the facility to reuse the wastewater.

E. Spill plan

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

The proposed permit requires this facility to follow, at a minimum, the best management practices listed in Special Condition S8.

F. Groundwater monitoring evaluation

In accordance with WAC 173-200-080, the proposed permit requires the facility to prepare and submit a hydrogeologic study of the land treatment site for Ecology review and approval in Special Condition S9. The facility must base the hydrogeologic study on soil and hydrogeologic characteristics. The goal of the study is to determine if discharge to the drain field has created a saturated interflow zone, and if so establish a monitoring network for sampling of that zone. The study must also determine whether the discharge/interflow is in hydraulic continuity with surface waters. To prepare the study, the facility must use *Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems*, (Ecology, 1993) and *Implementation Guidance for the Ground Water Quality Standards* (Ecology, 2005). Special Condition S10 details the installation of groundwater monitor wells.

G. Best management practices – land treatment site

Special Condition S1.B specifies best management practices (BMPs) are the actions identified to manage, prevent contamination of groundwater. BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. The list below describes best management practices applicable for land treatment sites.

The permittee must:

1. **Not** commingle process wastewater streams with sanitary (domestic) sewage.
2. **Not** discharge in excess of the hydraulic capacity of the drain field such that surface ponding occurs.
3. **Not** apply wastewater to the irrigation lands in quantities that would:
   a. Significantly reduce or destroy the long-term infiltration rate of the soil.
   b. Cause long-term anaerobic conditions in the soil.
   c. Cause ponding of wastewater and produce objectionable odors or support insects or vectors.
   d. Cause leaching losses of constituents of concern beyond the treatment zone or in excess of the approved design. Constituents of concern are constituents in the wastewater, partial decomposition products, or soil constituents that would alter groundwater quality in amounts that would affect current and future beneficial uses.
4. **Not** load BOD_5 to the system in excess of 100 lbs/acre/day.
5. **Not** discharge priority pollutants, dangerous wastes, or toxics in toxic amounts.

H. General conditions

Ecology bases the standardized general conditions on state law and regulations. They are included in all individual industrial state waste discharge permits issued by Ecology.

VI. Permit Issuance Procedures

A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary, to comply with water quality standards for groundwater, based on new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state regulations.

B. Proposed permit issuance

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of 5 years.

VII. References for Text and Appendices

Gavlak, R., D. Horneck, R.O. Miller, and J. Kotuby-Amacher.

3rd edition 2005. *Soil, Plant and Water Reference Methods for the Western Region* https://www.naptprogram.org/files/napt/western-states-method-manual-2005.pdf

Washington State Department of Ecology.

1993. *Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems*, Ecology Publication Number 93-36. 20 pp. https://fortress.wa.gov/ecy/publications/documents/9336.pdf

Laws and Regulations https://ecology.wa.gov/regulations-permits

Permit and Wastewater Related Information https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits

Revised October 2005. *Implementation Guidance for the Ground Water Quality Standards*, Ecology Publication Number 96-02. https://fortress.wa.gov/ecy/publications/summarypages/9602.html

December 2011. *Permit Writer's Manual*, Publication Number 92-109 https://fortress.wa.gov/ecy/publications/documents/92109.pdf

February 2007. *Focus Sheet on Solid Waste Control Plan, Developing a Solid Waste Control Plan for Industrial Wastewater Discharge Permittees*, Publication Number 07-10-024. https://fortress.wa.gov/ecy/publications/documents/0710024.pdf

November 2004. *Guidance on Land Treatment of Nutrients in Wastewater, with Emphasis on Nitrogen*, Ecology Publication #04-10-081; https://fortress.wa.gov/ecy/publications/documents/0410081.pdf

Appendix A--Public Involvement Information

Ecology proposes to issue a permit to National Food Corporation – Hilltop Farm. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice of Draft on October 16, 2019, in the *Everett Herald* to inform the public and to invite comment on the proposed draft state waste discharge permit and fact sheet.

The notice:

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Urges people to submit their comments, in writing, before the end of the Comment Period.
- Tells how to request a public hearing of comments about the proposed state waste discharge permit.
- Explains the next step(s) in the permitting process.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting*, which is available on our website at https://fortress.wa.gov/ecy/publications/summarypages/0307023.html

You may obtain further information from Ecology by telephone, 425-649-7000, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

The primary author of this permit and fact sheet is Christopher Martin.

Appendix B--Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Appendix C--Glossary

AKART -- The acronym for "all known, available, and reasonable methods of prevention, control and treatment." AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance -- An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site-specific basis following an AKART analysis. An "early warning value" must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality -- The existing environmental condition of the water in a receiving water body.

Ammonia -- Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average monthly discharge limit -- The average of the measured values obtained over a calendar months' time.

Background water quality -- The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time up gradient of an activity that has not been affected by that activity [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically up gradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

Best management practices (BMPs) -- Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5 -- Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD_5 is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass -- The intentional diversion of waste streams from any portion of a treatment facility.

Clean water act (CWA) -- The federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Continuous monitoring -- Uninterrupted, unless otherwise noted in the permit.

Date of receipt -- This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Detection limit -- The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Enforcement limit -- The concentration assigned to a contaminant in the groundwater at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a groundwater criterion will not be exceeded and that background water quality will be protected.

Engineering report -- A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal coliform bacteria -- Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab sample -- A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Groundwater -- Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Maximum daily discharge limit -- The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method detection level (MDL) -- See Method Detection Level.

National pollutant discharge elimination system (NPDES) -- The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

pH -- The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Point of compliance -- The location in the groundwater where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the groundwater as near and directly down gradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Quantitation level (QL) -- Also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer (64 FR 30417).

ALSO GIVEN AS:
The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency, December 2007).

Reasonable potential -- A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

Responsible corporate officer -- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Soil scientist -- An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 year(s), respectively, of professional experience working in the area of agronomy, crops, or soils.

Solid waste -- All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

State waters -- Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Storm water -- That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit -- A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria -- A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids -- That portion of total solids in water or wastewater that passes through a specific filter.

Total suspended solids (TSS) -- Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset -- An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water quality-based effluent limit -- A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D--Technical Calculations

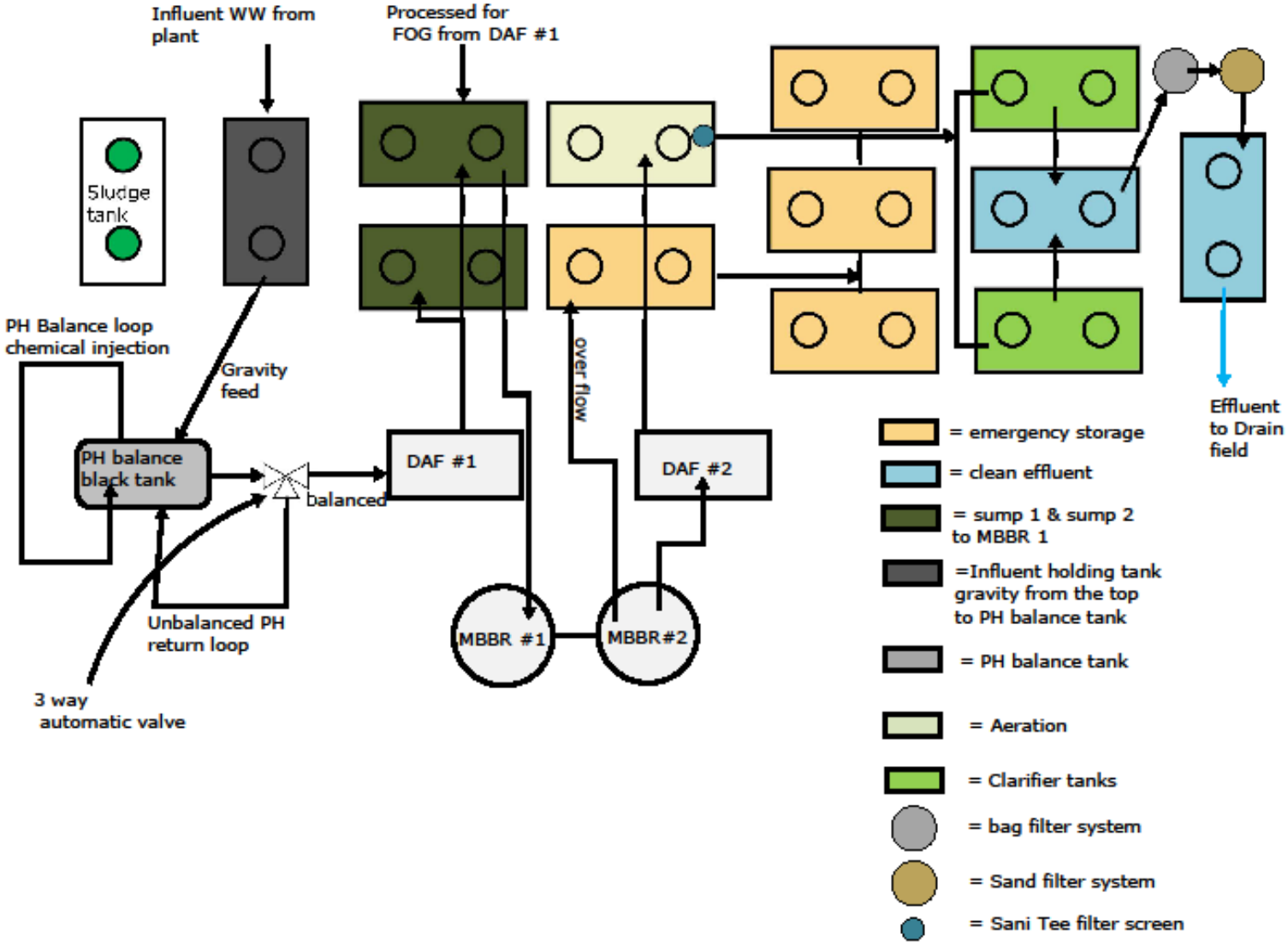

Figure 3. Wastewater Flow Diagram

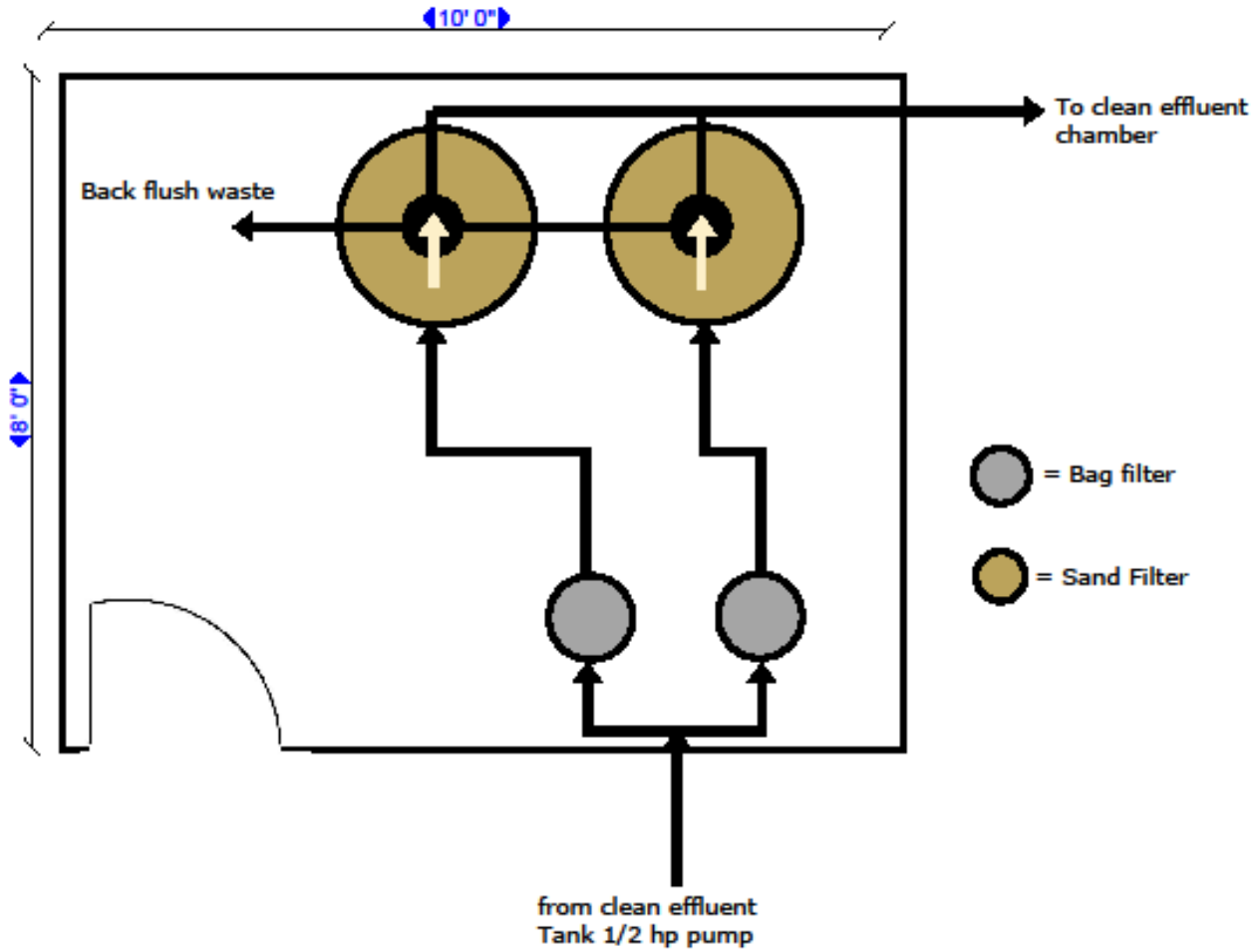

Figure 4. Filter Room Flow Diagram

Outline of Requirements to Comply With the Groundwater Quality Standards (Hydrogeologic Study Reports)

The Groundwater Quality Standards (GWQS) regulation Washington Administrative Code (WAC) 173-200 broadly describes the elements necessary to protect groundwater quality in the state of Washington. To assist with the implementation of this standard, the Department of Ecology (Ecology) prepared document #96-02, *Implementation Guidance for the Ground Water Quality Standards*. Chapter 4 of this guidance is specific to the requirements for the preparation of a Hydrogeologic Study (HGS). The purpose of the HGS is to collect and evaluate sufficient information to fully characterize the nature and extent of groundwater at a site, the wastewater disposal practice being proposed, and detail any potential impact from the proposed activities at the site. This information is used to establish enforcement limits, permit conditions and develop a monitoring plan, which will accurately assess each individual facility's impact on ground water quality.

The following is a detailed outline containing the elements, which must be considered when preparing a HGS.

The level of effort required to complete each element is dependent upon the facility and its unique situation. Factors that influence the level of effort include wastewater characteristics (volume, contaminants present, concentration) and site characteristics (depth of aquifer, geology, treatment capacity of the soils). For example, a facility that has a limited potential to contaminate may not be required to complete an HGS. The HGS must include all the components listed below, unless otherwise noted.

Hydrogeologic Study:

The hydrogeologic study is required if there is a reasonable potential to contaminate groundwater. Potential to contaminate is defined if both of the following conditions exist: 1) If there is a discharge of a regulated substance to the land surface or the subsurface and 2) the discharge rates are either greater than agronomic rates or the wastewater is stored in an impoundment (whether lined or unlined). A HGS may also be required for existing facilities if one has not been prepared in the past or there has been a change in the composition and/or amount of wastewater produced.

This HGS outline is considered guidance based on the GWQS regulation WAC 173-200. It is critical to remember that a HGS work plan must be submitted and approved by Ecology **BEFORE** the study is started. The HGS work plan should also refer to this guidance to tailor the scope of work based on site-specific conditions.

Ecology has discretion when reviewing and accepting a HGS work plan and report as site-specific circumstances dictate the necessary scope and breadth of each report.

Hydrogeologic Study Body

I. *Cover Letter*

Include a letter that describes the purpose of the submittal and specifying the facility this report will cover.

II. *Executive Summary*

The executive summary provides a synopsis of the information, sample collection and data analysis activities that occurred. It is recommended that the executive summary include:

a. Brief description: Describe the industrial processes that are generating (or are proposed to generate) wastewater at the site. Describe any wastewater treatment applied before land treatment/application. Describe the distribution system to an area where land treatment/application will occur. Each topic must be discussed in sufficient detail that the reader may understand why groundwater monitoring is required.

b. Purpose and goals: State the purpose of purpose of this report. The goals of the report may be, for example, to collect sufficient data to create a credible conceptual site model and determine the potential impacts of wastewater land treatment/application on groundwater.

c. Narrative summary of the data: Describe the data collected for this report. State whether the data met expectations regarding quality, extent and magnitude of potential impact(s), etc.

d. Summary of conclusions: These might include:

i. Existing monitoring well network remains adequate or, if inadequate, why alteration is needed.

ii. Data are valid and representative of aquifer conditions.

iii. Implications of unexpected results or events.

e. Summary of recommendations: These might include:

i. Changes to proposed land treatment/application plans and opportunities for monitoring optimization.

ii. Changes to monitoring well network; either addition or deletion of wells.

III. *Introduction*

a. General site information: Include facility contact information (permit applicant, responsible official, on-site contact person). Include the facility/site name, physical address, a general description of the type of facility and treatment method, and facility and discharge locations (e.g., GPS coordinates, Quarter Section Township Range).

b. Site history: Discuss past facility operations, the land treatment site, and changes to the surrounding area (e.g., facility was surrounded by open farmland, but is now adjacent to a residential area, etc.). Include a brief description of the processes that produced wastewater, wastewater volumes produced, location(s) where wastewater was discharged from the facility and how it was discharged to the environment, and if known, constituents and concentrations present in the discharge. (For example, the facility generates 11,000 gallons per day from the washing of fresh vegetables. Wash water is discharged via fixed sprinkler irrigation to 10 acres of pasture.).

Previous land use should be identified to determine what, if any, contaminants may be present in the subsurface. Consideration should be given to those discharges that have a potential to mobilize pollutants already present in the environment.

If there is a possibility of existing contamination at the proposed land treatment site, describe previous owners/operators, past uses of the site, and all potential/known sources of contamination (e.g., petroleum storage tanks, manufacturing processes, chemical storage, etc.).

c. Industrial process(es): Provide a detailed description of the current facility process(es) that produce wastewater, wastewater volumes produced, constituents and their concentrations present in the wastewater, and location(s) where wastewater is discharged from the facility and how it is discharged to the environment. Include drawings or flow diagrams of the various industrial processes that generate wastewater.

d. Treatment processes: Provide a detailed description of any treatment process(es) wastewater undergoes before discharge to the land treatment site, including influent and effluent constituent concentrations, and which constituents are treated and which likely pass through. Include drawings or flow diagrams of the treatment process(es) that wastewater undergoes.

This section also includes a description of the likely processes that will affect wastewater constituents at the land treatment site (e.g., volatilization, precipitation, adsorption, etc.)

e. Distribution system: Provide a detailed description of how the wastewater is transferred from the facility to the land treatment site (e.g., pumped from the facility to a holding pond and then to the fields) and how the wastewater is applied at the land treatment site (e.g., sprinkler irrigation, infiltration basin, etc.). Include drawings or flow diagrams of the distribution system.

f. Storm water system: If the land treatment site also receives storm water from the facility, provide a detailed description of the storm water collection system. Include drawings or flow diagrams of the storm water system showing the location of catch basins and connection(s) to the wastewater system.

Additionally, a site plan should be submitted which is drawn to scale. The facility site boundary and land ownership or uses of adjacent property should also be delineated on this map. The site map should include the following: property lines, buildings, structures, locations of wells, locations of other underground conveyance systems (i.e., underground storage tanks, septic systems, water lines, gas lines, etc.), location of geologic borings, the discharge point location, topography, plus any other relevant information.

IV. *Field Investigations*

a. Previous environmental investigations: Discuss any prior work performed, samples obtained, sample results, and any conclusions or recommendations made. Cite any previous environmental reports.

i. Evaluation of previous work: Discuss field and laboratory QA/QC methods, including field blanks and performance samples, if appropriate. Summarize the data validation reports and discuss any issues affecting data quality, including whether samples were representative and whether analytical results are reliable. Discuss whether this data met the data quality objectives for the project for which it was collected and how it meets the data quality objectives for this current project.

b. Site characterization: Discuss the current site characterization activities for each site media (surface water/sediments, soils, groundwater, and cultural history/archeology, as applicable). Name all constituents that are being characterized and discuss their

concentrations in the wastewater when discharged at the land treatment site and as found in site soils. Describe how any prior and the current work efforts contribute to the understanding of the current and/or natural conditions of the site.

i. Ambient groundwater quality: Ambient groundwater quality shall be assessed by a minimum of eight groundwater quality samples. A discussion of sampling/analytical results should include contaminants analyzed for in groundwater. Include comparison of the results to the GWQS, sampling method, laboratory method, and any special sampling or analytical protocols (silica gel, filtration, etc.). A qualitative evaluation of the quality of the data shall also be included. Compare new data with data from previous work and discuss any changes, trends, anomalies, etc.

ii. Groundwater depth and flow direction: Depth to ground water below the land surface must be defined by taking static water levels from a reasonable number of wells for a period sufficient to characterize groundwater elevation trends. Water level elevations should be monitored on a monthly or quarterly basis to determine seasonal variations in groundwater flow direction. Any discharge that includes infiltration as part of the land treatment must also include an evaluation of potential for mounding at the groundwater table.

iii. Location and construction of existing wells: All wells within a ¼-mile radius of the land treatment area should be located on a 7.5-minute topographic map (or some other appropriately scaled map). This includes domestic, irrigation, resource protection (monitoring), and public drinking water supply wells. Available information on the well use, construction, well depth, static water level, screened interval and geologic well logs should be included.

iv. Geology: The geology of a site should be characterized through the interpretation of on-site borehole data, well logs, geologic maps and cross sections [WAC 173-200-080 (4)(c)]. Structural features should be delineated, such as faults, fractures, fissures, impermeable boundaries or other subsurface features that might provide preferential pathways for contaminant migration. The geomorphology of the area should also be described including the topography and drainage patterns. The soils on the site should be identified and described by type, horizontal and vertical extent, infiltration rate, organic carbon content, and mineral content. The lithology of the uppermost aquifer and the overlying units in the unsaturated zone should be defined in terms of thickness, permeability, and aerobic\anaerobic conditions.

v. Hydrogeology: Hydrogeologic parameters should be identified, such as groundwater velocity, transmissivity, storage coefficient, vertical and horizontal hydraulic conductivity, porosity, and dispersivity [WAC 173-200-080 (4)(c)]. Groundwater flow conditions such as the flow rates, volumes and directions should be identified. Any existing available hydrographs or equipotential maps should also be included, along with the preparation and submittal of new ones derived from the current investigation.

Precipitation, evaporation, and evapotranspiration rates should be identified for the area.

vi. Surface water: Surface water bodies including lakes, wetlands, marine waters, streams, and the 100-year flood plain should be delineated on a 7.5-minute topographic map within a 1-mile radius of the facility. The discharge point should also be located on a topographic map.

c. Wastewater characterization: Facilities must analyze their effluent for those chemical, physical, biological, and radiological constituents which are or can be reasonably expected to be in their waste stream (WAC 173-200-080 (3)(d) and 080 (4)(a)). New facilities that have not yet been constructed can project the quality of their effluent by analyzing the waste stream from a similar type of operation. The quality, variability of pollutant concentrations, volume, rate, frequency and duration of the discharge should be described.

d. Soil treatment capacity: Provide a detailed description of the application site soils ability to treat the anticipated wastewater contaminants. This section shall include a description of the likely processes that wastewater constituents will undergo when traveling through the subsurface (adsorption, degradation, etc.) given the thickness of the vadose zone and estimated travel time through the vadose zone.

This discussion will cover topics such as soil permeability, soil/vadose zone depth, soil moisture patterns and seasonal groundwater table fluctuations, physical and chemical soil properties (such as particle size and composition, organic matter content, cation exchange capacity, etc.), and any limiting layers.

e. Area impacted: The area affected by the land treatment of wastewater and down gradient areas potentially affected by pollutant migration should be described. This is the area which will be affected either chemically, physically or biologically as a result of the activity. The area impacted should take into account advection, dispersion, and diffusion of contaminants in groundwater. The size of the area will depend upon the effluent quality, the aquifer characteristics, and the rate of assimilation. The applicant can demonstrate this by using a simple mixing equation or a computer model.

f. AKART: AKART is the acronym for "all known, available, and reasonable methods of prevention, control and treatment". AKART must be applied to all wastewaters prior to entry into groundwater. The permit applicant must evaluate for each pollutant or similar groups of pollutants the treatment technologies available and the degree of pollutant reduction provided by each treatment, and the capital and operating expenses of each treatment technology. Rationale for selecting the treatment technology proposed shall be provided (WAC 173-200-080 (4)(d)). Reducing or eliminating the discharge should also be evaluated.

If the applicant is relying on site-specific characteristics to treat the discharged wastewater, then contaminant attenuation due to site-specific treatment must be demonstrated and quantified. If crops or vegetation are included as part of the treatment, the facility must meet the specific requirements outlined in Ecology's "Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems" (1993). Elements that must be assessed include a description and characterization of the soils, cation exchange capacity, electrical conductivity, depth to water, fraction of organic carbon content in the soil, pH, precipitation, evapotranspiration, and estimated constituent uptake for the proposed crop/vegetation.

g. Beneficial uses: All existing and future beneficial uses for groundwater should be identified for the area that will be impacted by the facility's discharge. Beneficial uses are defined as uses of the waters of the state, which include but are not limited to, domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power, preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state. Determination of beneficial use impairment should consider impairment of surface water uses as well as groundwater uses. Beneficial uses of groundwater can be evaluated by identifying land ownership, land use, zoning restrictions, and well water use in the surrounding area. Future beneficial uses should also be projected if possible.

V. *Conceptual Site Model*

Conceptual Site Model (CSM). This section shall present a conceptual site model for the land treatment area. The CSM shall be developed by a synthesis of and discuss potential contaminant release, fate and transport, exposure pathways (surface water, groundwater wells, air, direct contact, etc.), and potential receptors (human, aquatic, terrestrial). Describe typical concerns for this type of environmental contamination, and include a discussion of site-specific concerns (hydrogeologic setting, receptors, current or future site zoning/land use etc.).

VI. *Summary, Conclusions, and Recommendations*

a. Summary and conclusions: Summarize what is known about the site, the wastewater, and wastewater constituents. Include an evaluation of wastewater constituents to their respective GWQS, highlighting any that exceed a GWQS or background. Discuss constituents that may be used as "indicator substances." Ensure conclusions are supported by the tables and figures included with the report.

Also include a discussion covering factors contributing to facility impacts and any potential mitigation measures that can be taken.

b. Recommendations: Outline possible additional treatment methods if appropriate. Besides treatment, consideration should also be given to whether changes in facility operations, raw materials, or other such factors can reduce contaminant concentrations in wastewater.

Hydrogeologic Study Figures

General – Figures should include a north arrow, scale, complete legend, measurement units, and annotated clarification as necessary. Figures should not be cluttered and must be legible at the size presented. Document text must reference figures and draw conclusions consistent with information presented on figures. Consider using multiple figures when showing large amounts of information.

VII. *Process Flow*

a. Include drawings or diagrams of industrial processes at the facility that generate wastewater. Include water volume used, wastewater volume produced, and discharge point for wastewater.

b. Include drawings or diagrams of processes at the facility that treat wastewater. Include wastewater volume influent to the treatment system, wastewater volume effluent to the treatment system, and discharge point for wastewater.

c. Include drawings or diagrams of the land treatment application site at the facility. Include locations of any pump station, holding ponds, irrigation lines, spray heads, treatment area/field outlines, distribution ditches, and other discharge points for wastewater.

VIII. *Vicinity Map(s)*

a. Show property in relation to surrounding region. Area covered by Vicinity Map should be proportional to site size.

b. Show other applicable items including (but not limited to) surface topography, natural areas, surrounding land uses, location of drinking water supply wells within a one-mile radius and monitoring wells within a one-quarter-mile radius.

c. Other areas of designation to be identified include Ground Water Management Areas, Sole Source Aquifers, Special Protection Areas, Wellhead Protection Areas, and Critical Aquifer Recharge Areas.

IX. *Site Map(s)*

a. Show overall site layout with site features (holding tanks/ponds, land treatment area, storm water catch basins, other discharge locations) and well, boring, and sampling locations labeled consistently with current and historical site data and sample names used in the report. If multiple names exist for a sampling location or area of the site, indicate this.

b. Include wastewater constituent sample locations, concentrations, and estimated vertical and horizontal extent of contamination for site media, as applicable (show current and historical features).

c. Show geologic/hydrogeologic information including soil types, wells, screened intervals, and water levels (cross sections are useful for showing this information). Show groundwater flow direction and gradient.

d. Show other relevant information including (but not limited to) site and property boundaries, buildings/facilities on site, historical site features, underground storage tanks (USTs), previous excavation/interim action activity, etc.

e. Show groundwater flow direction and gradient on a potentiometric map. If cross-sections are used show and label hydrogeologic units.

X. *Conceptual Site Model*

Provide figures showing exposure pathways and the location of potential and/or actual receptors. The lateral and vertical extent of any existing contamination, as currently understood, should be clearly conveyed.

Hydrogeologic Study Tables

General – Tables should include detailed notes that explain any laboratory or other designations, assumptions, and references. All acronyms used in the table should be defined in a section of the notes even if they are defined in the body of the report, so table information can be quickly understood.

a. Sampling information/laboratory methods: Include current and historical sampling methods and results, lab methods, detection limits, reporting limits, and any special sampling protocols with justification or explanation (e.g. silica gel, filtration).

b. Site data: Include current and historical analytical and field-measured data. For larger data sets, consider making a summary table of average and maximum values. Non-detectible levels should be noted as 'U' with the numerical laboratory reporting limit provided rather than 'ND'.

Hydrogeologic Study Appendices

General – Appendices should contain a description of content and explain how to interpret the information for use. Not all of the following appendices suggestions will apply to all sites.

a. Exploratory logs, well installation diagrams, groundwater sampling logs, and field records.

b. Analytical laboratory report and Quality Assurance/Quality Control report.

c. Details of field and analytical methods used in former and current investigations. If applicable, append Work Plan/Sampling and Analysis Plan/Quality Assurance Project Plan/Health and Safety Plan.

d. Limitations. Explain any limitations that apply to the information provided in the study.

e. Other documents that provide additional context or contribute to the understanding of the site.

Miscellaneous Items

a. Environmental Information Management (EIM). All sampling data must be uploaded into Ecology's EIM database. This allows Ecology to access data, check results, and/or perform additional analyses. For more information, reference: http://ecology.wa.gov/Research-Data/Data-resources/Environmental-Information-Management-database

b. Certification (Licensed Professional Stamp). Hydrogeologic, geologic, and engineering work must be performed under seal of an appropriately licensed professional (RCW 18.43 and 18.220).

c. Submittal requirements. Ecology requests three copies of reports submitted per WAC 173-340-850. Please contact the permit manager for specific submittal requirements.

As required by Ecology, additional information may be requested to fully characterize the site.

Appendix E--Response to Comments

[Ecology will complete this section after the public notice of draft period.]