

GROUND WATER QUALITY DISCHARGE PERMIT UGW490005 STATEMENT OF BASIS

Elberta Valley Ag
Elberta, Utah
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Introduction

The Director of the Division of Water Quality (Director) under the authority of the Utah Ground Water Quality Protection Rules¹ (Ground Water Rules) issues ground water discharge permits to facilities which have a potential to discharge contaminants to ground water². As defined by the Ground Water Rules, such facilities include large dairies and feedlots and ponds and lagoons whether lined or not. As defined in Utah Admin. Code R317-6-1, Elberta Valley Ag is considered an existing facility because it was under operation before February 10, 1990. The Ground Water Rules are based on an anti-degradation strategy for ground water protection as opposed to non-degradation; therefore, discharge of contaminants to ground water may be allowed provided that current and future beneficial uses of the ground water are not impaired and the other requirements of Rule 317-6-6.4.C are met³. Following this strategy, ground water is divided into classes based on its quality⁴; and higher-quality ground water is given greater protection⁵ due to the greater potential for beneficial uses.

The Director has developed permit conditions consistent with Rule 317-6 and appropriate to the nature of the wastewater, facility operations, maintenance, discharge minimization technology⁶ and the hydrogeologic and climatic conditions of the site, to ensure that the operation not contaminate ground water.

Basis for Permit Issuance

Under Rule 317-6-6.4A, the Director may issue a ground water discharge permit for an existing facility if:

- 1) The applicant demonstrates that the applicable class TDS limits, ground water quality standards and protection levels will be met;
- 2) The monitoring plan, sampling and reporting requirements are adequate to determine compliance with applicable requirements;
- 3) The applicant utilizes treatment and discharge minimization technology commensurate with plant process design capability and similar or equivalent to that utilized by facilities that produce similar products or services with similar production process technology; and,

1 Utah Admin. Code Rule 317-6

2 https://deq.utah.gov/ProgramsServices/programs/water/groundwater/docs/2008/08Aug/GWQP_PermitInfo.pdf

3 Preamble to the Ground Water Quality Protection Regulations of the State of Utah, sec. 2.1, August 1989

4 Utah Admin. Code Rule 317-6-3

5 Utah Admin. Code Rule 317-6-6.4

6 Utah Admin. Code Rule 317-6-6.4(C)(3)

- 4) There is no impairment of present and future beneficial uses of ground water.

Purpose and Prior Permitting

The purpose of this statement of basis is to describe the Elberta Valley AG facilities, ground water quality, and compliance monitoring program. Ground Water Discharge Permit UGW490005 was initially issued to Elberta Valley AG in September 2005. Subsequent renewals of the permit were issued on August 26, 2010 and October 2, 2015. This will be the third renewal of the permit. Ground Water Discharge Permit number UGW490005 is being renewed in accordance with UAC R317-6-6.6.

Description of Facility

Elberta Valley Ag operates a dairy farm and wastewater treatment facility in Utah County, Utah. The dairy is situated on approximately 160 acres of land located 1 mile south of Elberta, Utah, in Section 20, T10S, R1W, and SLBM. The dairy uses liquid waste handling systems and has more than the following numbers of confined animals: 1,500 slaughter and feeder cattle; or 1,050 mature dairy cattle, including both milked and dry cows. Elberta Valley Ag's dairy design maximum is 5,000 dairy cows. Dairy cows are milked three times a day using machine milkers. Milk is produced and transported from the site for pasteurization and distribution. Raw materials consumed at the site include animal feed and water.

The cows are housed in covered barns with alleyways that are periodically flushed with water. The wastewater from cleaning the alleyways runs through a separator where the solids are removed. The liquid waste is placed into treatment ponds. Manure is a by-product of the dairy operations and the solids are stored in a composting area for use as fertilizer and as dry bedding, pursuant to the CNMP ([Appendix A](#)).

The existing dairy started in 1978 as the Butler Stake Welfare Farm and initially had 200 dairy cows. From 1980 to 1993, liquid waste from the dairy was managed using two unlined ponds. In 1993, the dairy expanded to 700 dairy cows and the name was changed to Elberta Dairy. The two wastewater ponds were excavated and converted to a single pond, and two additional ponds were constructed. All three ponds were lined with polypropylene vinyl lining and currently have a combined storage capacity of 3.9 million gallons. The operation of these ponds is described in the Ownership and Operation Manual ([Appendix C](#)).

The current treatment lagoon system consists of five cells. When full, the five cells can contain up to 76.08 million gallons of partially treated "red" water mixed with manure from flushing free stall barns. The daily discharge volume from the treatment pond varies depending on the number of cows milking. Discharge wastewater from treatment pond cells is used for land application. The *Elberta Valley Ag Comprehensive Nutrient Management Plan* (CNMP) has been developed to minimize impact to ground water from farm operations by applying wastewater at the appropriate agronomic uptake rate ([Appendix A](#)).

Site Hydrogeology

The dairy site is located in the Goshen Valley, with the East Tintic Mountains on the west and Long Ridge on the east. Goshen Valley is situated within the hydrologic Great Basin, referring to that portion of the Basin and Range Province with no hydraulic drainage to the sea. Sources of surface recharge include streams, irrigation canals, irrigation, precipitation, and ephemeral runoff. Aquifer recharge in the Goshen valley is primarily from subsurface inflow from the consolidated rock of the surrounding mountains. Water Resources Investigation Report 93-4221 (USGS 1994, plate 5) indicates that the Elberta Valley Ag facility is in an aquifer recharge area that eventually discharges to Utah Lake. In this area of the valley, the vertical hydraulic gradient is downward and there are no confining layers to prevent shallow contamination from reaching the commonly used aquifers.

Ground water occurs under confined and unconfined conditions and regionally⁷ moves from the recharge areas of the mountain fronts toward the Utah Lake discharge area. South of Elberta, a ground water depression in the unconfined aquifer level has been created by pumping approximately 5,500 acre-ft. of ground water per year for agricultural uses.

Surface geologic mapping in the site area shows three Quaternary formations are present: alluvial deposits, Provo Formation, and lake bottom sediments. The finer grained lake bottom sediments are typically clays, silts, and sands. Subsurface sediments observed during drilling and installation of three site monitoring wells were predominantly sands, with a 20 to 30 foot thick section of silty clays near the ground surface.

Ground Water Classification

The Goshen Valley has a history of impacts that have affected ground water quality now measured in valley water supply wells. Seepage from irrigation canals, certain fertilized and irrigated land, and mining evaporation ponds have contributed to diminished ground water quality in some areas. Waters from the Burgin Mine in the East Tintic Mountains were transported 2 miles in a ditch system to evaporation ponds a mile northeast of the dairy in the 1960s. Background water quality is based on historical data from area irrigation water supply wells prior to original permit issuance and subsequent accelerated sampling of new compliance wells at the dairy. Water supply wells are screened over larger intervals of the basin aquifer(s) and are not always representative of the shallow aquifer. In the general area surrounding the Elberta Valley Ag dairy, ground water in the unconfined aquifer underlying the site and beyond is Class III Limited Use Ground Water. Although the total dissolved solids (TDS) concentrations in area wells are less than 3,000 mg/L (Class II), concentrations of contaminants such as nitrate and sulfate in excess of Utah Ground Water Quality Standards precludes its use as drinking water without substantial treatment and therefore make it a Class III ground water.

⁷ Data collected by the Permittee indicates movement of groundwater at the site in a northwesterly direction.

Deeper aquifers are Class II Drinking Water Quality Ground Water.

The network of compliance monitoring wells provides the ability to detect contamination from the permitted facility in the shallow aquifer. The compliance monitoring wells are screened in the shallow aquifer near the treatment ponds. Under the provisions of this permit, ground water contamination in excess of applicable groundwater protection levels in the shallow aquifer would be a reason for the Permittee to take remedial action before deeper aquifers are affected. The dairy has installed three monitoring wells at the site to determine groundwater flow direction in the shallow aquifer. Following well development and water level measurements, it is determined that MW-4 is down gradient of the treatment pond cells, MW-3 is up gradient of the treatment pond cells, and MW-2 is cross-gradient. MW-2 is used to monitor the older dairy wastewater ponds.

At the dairy, monitoring wells have elevated levels of nitrate and Total Dissolved Solids (TDS). Wells MW-2 and MW-3 have in the past detected levels of Total Nitrate/Nitrite (as N) that are 14 to 34 times higher than the Utah Ground Water Quality Standard of 10 mg/L. Total Dissolved Solids in these wells have been 3 to 5 times higher than the best water quality found in MW-1.8 These are the highest reported levels of nitrate found in the area. This permit requires that the expanded dairy not cause any further degradation of aquifer quality beyond that existing at time of initial permit issuance. Corrective action to improve the localized excessive levels of TDS and nitrate in ground water may be required if levels increase or show no diminution over an extended period of time. However, sampling over the prior permit renewal period generally reflects an improvement in water quality, and corrective action is not recommended at this time.

Basis of Permit Issuance

The administration of the permit, to assure compliance with ground water protection regulations, is founded on the use of periodic monitoring well sampling to assess potential impacts to ground water quality from the treatment pond discharges. The determination of impacts from past and present-day releases to ground water is a major concern for ground water management. Elberta Valley Ag has proposed to continue controlled land application of wastewater, and evaporation, as approaches to reduce impacts to ground water. The *Elberta Valley Ag Comprehensive Nutrient Management Plan* is used to regulate discharge wastewater to agricultural fields at appropriate agronomic rates.

Compliance Requirements

1. Final Closure Plan. In the event that the Permittee decides to discontinue its operations at the facility the Permittee shall notify the Director of such a decision

⁸ MW-1 is no longer in operation and has been replaced by MW-4.

and submit a Final Closure Plan. The Final Closure Plan shall be submitted no later than 180 days prior to the closure of the facility. The Permittee shall resubmit Final Closure Plans within 60 days of receipt of written notice of deficiencies therein. Any material changes made to this plan after it receives Director approval shall require approval of the Director.

Permit Reference Documents

The following documents are considered part of the ground water quality discharge permit application and will be kept as part of the administrative file.

- 1) Elberta Valley Ag Comprehensive Nutrient Management Plan (App A), August 2020
- 2) Elberta Valley Ag Owner and Operations Manual (App B), August 2020
- 3) Elberta Valley Ag Sampling and Analysis Plan (App C), August 2020

DWQ-2020-011431

Figure 1 – Site Map

