

**GROUND WATER DISCHARGE PERMIT UGW010013
STATEMENT OF BASIS**

**Alpental Energy Partners
Blue Mountain Biogas Facility
Permit No. UGW010013**

July 2011

Purpose

Alpental Energy Partners proposes to construct a biogas plant near Thermo in Beaver County, Utah. This Ground Water Discharge Permit will require best available technology and ground water compliance monitoring for two anaerobic digesters, equalization basins, lift stations at 8 hog farm manure lagoons, and associated pressurized piping.

Hydrogeology

Regional. The Milford Valley lies within the Basin and Range physiographic province. The area is dominated by normal block fault structures common to the Basin and Range Province, however there are areas where thrust faults are present the valley. The Mineral Range east of the site is a large Tertiary intrusion that caused mineralization in Paleozoic limestone and dolomite.

Local. The stratigraphy at the site consists of Quaternary age alluvium. These sediments are poorly-sorted stream, alluvial fan, slope-wash, and talus deposits. Sediment thickness is estimated to be in excess of 420 feet based on water supply wells drilled in the area.

The shallowest ground water underlying the site is an unconfined water table aquifer comprised of gravel, sand, silt and clay in unconsolidated and semi-consolidated alluvial deposits. Ground water aquifers in the southern portion of the Milford Valley are recharged by ephemeral streams, subsurface inflow from bedrock in the mountains, and precipitation on the valley floor. Depth to ground water under the site is approximately 70 feet below ground surface and flows from west to east toward the valley center.

Ground Water Quality

Ground Water Class. The uppermost shallow ground water at the site is classified as Class IA Pristine Ground Water based on nearby wells west of the facility. Other wells south and east of the facility indicate that a transition zone to Class II Drinking Water Quality may be near or under the facility.

Background Ground Water Quality. Site-specific background ground water quality will be determined from an accelerated background monitoring program by collecting at least eight samples from each site-specific monitoring well over a two-year period for the parameters listed in the Water Quality Sampling, Handling, and Analysis Plan.

The Permittee will submit an Accelerated Background Monitoring Report in accordance with the requirements in Part I.G.2 of this permit. This report will include the following statistical calculations in spreadsheet form for each parameter in each monitoring well using the accelerated background monitoring data:

- Mean concentration;
- Standard deviation;
- Mean concentration plus two standard deviations;
- Mean concentration times 1.25; and
- 0.25 times the Ground Water Quality Standard.

After a technical review and approval of the Accelerated Background Monitoring Report, the Executive Secretary will reopen the permit to set well-specific ground water protection levels for each parameter and compliance monitoring well according to UAC R317-6-4.

Interim Ground Water Protection Levels

Site-specific Ground Water Protection Levels will be established after the completion of the accelerated background monitoring program described in Part I.G.2 of this permit. In the meantime, the interim protection levels in Table 1 below will be used.

Table 1: Interim Ground Water Protection Levels

Parameter	Interim Protection Level (mg/l)
Total Dissolved Solids	500 ^(a)
Chloride	62.5 ^(b)
Sulfate	62.5 ^(b)
Bicarbonate	226 ^(c)
Nitrate + Nitrite as N	2.5 ^(d)
Ammonia as N	7.5 ^(e)
Bromide	1.0 ^(c)

- (a) Equals the upper limit of Class IA Pristine Ground Water.
- (b) Equals 0.25 times EPA Secondary Drinking Water Standard.
- (c) Based on water quality data of a nearby upgradient monitoring well.
- (d) Equals 0.25 times the Utah Ground Water Quality Standard.
- (e) Equals 0.25 times the EPA Lifetime Health Advisory.

Ground Water Compliance Monitoring

After Ground Water Protection Levels have been established for site-specific wells from the accelerated background monitoring program, the Permittee will conduct semi-annual ground water compliance described below.

- 1) Depth to ground water will be measured to the nearest 0.01 foot below the top of the well casing before collecting any samples from the monitoring wells.

- 2) Ground water elevations will be determined by subtracting the depth to ground water measurement from the surveyed top of casing elevations and reported in feet above mean sea level to the nearest 0.01 foot.
- 3) Ground water samples will be collected from each monitoring well in accordance with the approved Water Quality Sampling, Handling, and Analysis Plan for the following analyses:
 - a. Field Stabilization Parameters pH, temperature, and specific conductance.
 - b. Laboratory Parameters listed below.
 - Ammonia as N
 - Chloride
 - Nitrate + Nitrite as N
 - Total dissolved solids (TDS)
 - Bicarbonate
 - Sulfate
 - Bromide

In addition, select samples will be analyzed for other ions in Table A-1 and Table A-2 of the Water Quality Sampling, Handling, and Analysis Plan (Appendix A).

All laboratory analyses shall be performed by a laboratory certified by the State of Utah in accordance with UAC R317-6-6.3.L.

Best Available Technology

The administration of this permit is founded on the use of best available technology, in accordance with the requirements of UAC R317-6-1.3. The Blue Mountain Biogas Facility will be a no-discharge facility with an approximate capacity of 19.1 million gallons. The digesters, equalization basins, and piping are a closed system. The facility generates no waste of its own.

The Best Available Technology design for the digesters and equalization basins includes 80-mil synthetic high-density polyethylene (HDPE) flexible membrane liner. The equalization basins are designed to contain sufficient fluid so that a stabilized volume of material can be pumped into the digesters on a daily basis. Digesters and equalization basins are designed with three feet of total freeboard above the design fluid level. Both of the digesters are covered.

Liner integrity will be evaluated prior to operation with the approved construction quality assurance/quality control (CQA/QC) plan and the associated Construction Certification As-Built Report as required by the Construction Permit.