TECHNICAL REVIEW DOCUMENT
for
OPERATING PERMIT 98OPWE204

to be issued to:

Nutri-Turf, Inc.
Weld County
Source ID 1230497

Cathy Rhodes
May, 1999

I. PURPOSE:

This document will establish the basis for decisions made regarding the applicable requirements, emissions factors, monitoring plan and compliance status of emission units covered by the operating permit proposed for this site. It is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the original application submittal of February 15, 1996, subsequent supplemental technical submittals, and previous inspection reports.

Any revisions made to the underlying construction permits associated with this facility in conjunction with the processing of this Operating Permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This Operating Permit incorporates and shall be considered to be a combined construction/operating permit for such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this Operating Permit without applying for a revision to this permit or an additional or revised Construction Permit.

II. SOURCE DESCRIPTION:

This facility is an auxiliary operation of the Anheuser-Busch, Inc., Fort Collins Brewery. A portion of the brewery wastewater is piped to this site for land application. The land is irrigated through center pivots with wastewater so that soil bacteria can break down the soluble organics and the vegetation can utilize the water and the nutrients. The production of brome grass, alfalfa, other grasses, wheat, and corn is sold. The Brewery is undergoing review under Operating Permit 95OPLR064.

This facility is located on County Road #15, in Weld County. The area is classified as an attainment area for all pollutants. The landfarm is not subject to the Accidental Release Program provisions of 112(r). Wyoming is an affected state within 50 miles of the facility. There are two Federal Class I areas within 100 kilometers of the facility: Rocky Mountain National Park and Rawah National Wilderness Area.

Facility wide emissions are as follows (tons per year):

Pollutant	Actual	Potential
VOC	138 - 337	5,205*
	50 - 137	2,127 **

*Actual and Potential emissions prior to distillation
**Actual and Potential emissions after distillation
The range of actual emissions is defined by actual on-site testing (minimum) and literature data (upper-end)

Emissions associated with the Brewery are:

Pollutant	Allowable (TPY)	Actual (TPY)
Particulate Matter (PM)	184	8
PM_{10}	184	8
Nitrogen Oxides (NO_x)	621	73
Sulfur Dioxide (SO_2)	1388	<1
Volatile Organic Compounds (VOC)	184	66
CO	64	18

This source does not emit major amounts of any Hazardous Air Pollutants.

Prevention of Significant Deterioration (PSD) Analysis

The Division has determined that the Fort Collins brewery and this landfarm site are a single source for purposes of determining PSD applicability. SO_2 and NO_x emissions at the brewery exceed the PSD threshold of 250 tons/year, therefore this source is classified as a major stationary source for PSD purposes. In addition, PM and VOC emissions exceed significant levels, therefore they are also subject to PSD. The EPA issued the brewery a PSD permit for PM, SO_2, and NO_x on March 15, 1984. At the time of the PSD application the best available emission factors for VOCs indicated emissions were below the significant level of 40 tons/year, and therefore not subject to PSD. Recent studies indicate that VOC emissions are greater than first thought, and that VOC emissions are subject to PSD. Anheuser-Busch and the Division entered into a Settlement Agreement which required Anheuser-Busch to submit a PSD application for VOC sources at the brewery and the landfarm. The application was submitted in July, 1996. PSD requirements for VOC sources are incorporated into this Operating Permit through a combined construction/operating permit procedure.

III. EMISSION SOURCES

The following sources are specifically regulated under the terms and conditions of the Operating Permit for this site:

Area 20 - Land Application of Wastewater

The brewery's higher strength process streams are distilled to reclaim ethanol before being discharged into the wastewater system. Brewery wastewater is either sent to the Fort Collins publicly owned treatment works or is sent to the landfarm via a six mile pipeline. The wastewater is stored in five 1.5 million gallon open storage tanks, and then piped to pivot sprinklers for application the next morning. Alfalfa and other similar crops are produced.

Applicable Requirements -

Colorado Regulation No. 3, Part B, IV.D.3 - PSD Requirements

Requires BACT
Requires impact analyses
(See discussions, below)

Colorado Regulation No. 7, Section VA. - Disposal of VOCs

May not evaporate or spill VOCs unless RACT is utilized

During Settlement Agreement discussions, the Division determined that distillation and landfarming represent RACT for treatment of the brewery wastewater

Other

Limit amount of wastewater disposed of at the landfarm to 930.75 million gallons per year - this is based on the permittee's estimate that 2.55 million gallons per day will be sent to the landfarm

Limits VOC emissions to 96 tons/year - this is based on the assumption that 4.5% of total ethanol is emitted from storage tanks, application evaporation, and soil evaporation - this represents the average emissions for the range of emission estimates discussed below

Requires vegetative cover year round, except as required following tilling and seeding for crop rotation and field work, per standard agricultural practices

Requires measures to minimize misting (evaporation) from the irrigation system (these measures are currently in place)

Best Available Control Technology (BACT)

The permittee and the Division examined the following options for controlling emissions from wastewater:

Treatment at the Fort Collins publicly owned treatment works (POTW)

Treatment at the Brewery (On-site Wastewater Treatment Plant, WWTP)
Land application for Growing Crops

These options are described below. Prior to disposal, the Brewery distills high ethanol concentration wastewater streams for recovery of ethanol, thus reducing the potential VOC emissions from 5,205 tons/year to 2,127 tons/year. The cost information provided below does not include the cost of distillation.

POTW: This option would send all brewery effluent to the Fort Collins Drake Water Reclamation facility. Given the increased hydraulic and organic loadings that the water plant would experience, significant upgrades to the plant would be required. The cost of upgrades is borne by Anheuser-Busch.

On-Site WWTP: A survey of other breweries indicated that Anheuser Busch's Baldwinsville, New York brewery is the only Anheuser Busch brewery that uses an on-site waste water treatment plant. The treatment plant was part of the brewery when purchased by Anheuser Busch, Inc. All but three Miller breweries send their waste water to a POTW; the other three have on-site sludge removal facilities, and treated water is discharged into a river, and sludge is used for crop application. The Coors brewery in Golden, Colorado treats some of its water using an on-site WWTP, and sends some to a POTW. The Anheuser-Busch Fort Collins brewery is approximately one third the size of the Coors brewery. On-site WWTP is not considered a viable option for treating the Fort Collins Brewery wastewater.

Land Application: VOC emissions are reduced through physical, chemical and biological processes occurring in the soil and through nutrient uptake by the associated vegetation. Ethanol and other constituents in the applied wastewater are degraded, and transformed or immobilized in the soil/plant matrix. These same processes occur in conventional wastewater treatment systems. Land application treatment is dependent almost entirely on the microorganisms living in the soil for the degradation of organic substances. The biological processes occur in the upper soil layer as the applied organics are degraded by the microorganisms in the soil. The irrigation system is designed to minimize evaporative losses. The system is equipped with pivot sprinklers, drop pipes which extend the spray nozzles toward the ground, droplet producing nozzles, and splash plates for maximizing droplet size. The emission and cost information provided below is based on the range of data available (see discussion under Emission Factors, below).

The following table lists Division estimated emissions and costs for each option available at the time of construction. Potential emissions before treatment/control are 2,127 tons/year.

CONTROL OPTION	EMISSIONS (TPY)	COST EFFECTIVENESS ($/TON)
Landfarm - 1%/1.5%	50	3855
Landfarm - 1.5%/5%	137	4023
POTW	149	4540

RACT/BACT/LAER Clearinghouse - No information for brewery wastewater treatment was found in the EPA's control technology determination data base.

BACT Determination: The Division has determined that distillation and landfarm application represents BACT for the treatment of the Anheuser Busch Fort Collins Brewery wastewater. Taking into account the associated uncertainties, it appears distillation and landfarm application can control VOCs at least as well, if not better, than treatment at a POTW. In addition, landfarm application reduces the energy requirements needed, and amount of sludge produced, for POTW treatment. (Note: Operating Permit 95OPLR064 sets forth requirements for distillation of high-concentration wastewater streams to recover ethanol prior to transfer to the landfarm.)

Ambient Air Quality Impact
The brewery and landfarm have been in operation since 1988, and ambient monitoring data for the Fort Collins area have not indicated any exceedance of the National Ambient Air Quality Standard for ozone. In addition, modeling performed during the preliminary analysis for the Construction Permits, based on 22 tons/year of VOC, resulted in a 1 hour impact of .05 micrograms per cubic meter. The Division expects the impact based on the emission rate listed in the above table will not cause or contribute to an exceedance of the ambient ozone standard.

Air Quality Related Values (AQRVs)
The Division notified the National Park Service and United States Forest Service regarding these VOC emissions. Preliminary review indicates the Federal Land Managers (FLMs) do not expect the emissions to adversely affect AQRVs at Class I areas. The FLMs will have an opportunity to fully review the PSD application and analyses during the public notice period.

Emission Factors - Emissions occur at three points: the storage tanks; between irrigation nozzles and the ground; and evaporation from the ground and plant surfaces.

Various information was examined for estimating emissions:

> In 1992, the permittee estimated emissions from the storage tanks using physical chemical laws. Emissions from the landfarm were calculated using estimations of how much ethanol the plants would use as nutrient, and how much would be degraded by soil microbial activity. The permittee determined that 1% of the ethanol would be emitted from the landfarm. In 1997, the permittee conducted a site-specific soil microbial study to evaluate seasonal (summer vs. winter) changes in microbial abundance and activity of soil microorganisms degrading brewery wastewater. For estimating emissions for the Operating Permit, the permittee used 1% evaporation between nozzle and ground (0.6% summer/fall and 0.4% winter/spring), and 1.5% evaporation from soil (0.9% summer/fall and 0.4% winter/spring). In addition, average ethanol concentrations for summer and winter, as measured during short sampling periods over the years, were used.
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> A review of available literature indicates that spray evaporation can not exceed 2 to 3%, but a reasonable estimate for average typical conditions in eastern Colorado is 1.5% (Wright Water Engineers, 1993). In addition, the literature indicates that evaporation from the surface of the ground and from leaf surfaces would typically amount to 5% (Wright Water Engineers, 1993).
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> Over the years, the permittee has conducted sampling to determine ethanol concentrations at various points in the process. Data indicate that the daily ethanol concentration can vary significantly.

Given the uncertainties regarding ethanol concentration, differences in emissions estimation methods and available literature data, and lack of site-specific data regarding microbial destruction efficiency, the Division is proposing a compromise for estimating emissions from this source. The compromise assumes that 4.5% of the ethanol that is applied to the landfarm evaporates. The permittee will not be required to perform separate calculations for the pipeline, the tanks, application evaporation, and evaporation after application. The Division believes this is a reasonable compromise between the permittee's study data and literature data.

Monitoring Plan - Flow meters measure the amount of water sent to the landfarm. Semiannual (summer and winter) ethanol sampling is required. The permittee is required to continue using measures to minimize misting (evaporation) from the irrigation system.

Compliance Status - The issuance of this permit brings the source into compliance with PSD and State Construction Permit, and Settlement Agreement requirements.

IV. Alternate Operating Scenarios

The Title V application did not include a request for any Alternate Operating Scenarios.

V. Short Term Limits

On April 16, 1998 the Colorado Air Quality Control Commission directed the Division to implement new procedures regarding the use of short term emission and production/throughput limits on Construction Permits. These procedures are being directly implemented in all operating permits that had not started their Public Comment period as of April 16, 1998. All short term emission and production/throughput limits that appeared in the construction permits associated with this facility that are not required by a specific State or Federal standard or by the above referenced Division procedures have been deleted and all annual emission and production/throughput limits converted to a rolling 12 month total. Note that, if applicable, appropriate modeling to demonstrate compliance with the National Ambient Air Quality Standards was conducted as part of the Construction Permit processing procedures. If required by this permit, portable monitoring results and/or EPA reference test method results will be multiplied by 8760 hours for comparison with annual emission limits unless there is a specific condition in the permit restricting hours of operation.

VI. Emission Factors

From time to time published emission factors are changed based on new or improved data. A logical concern is what happens if the use of the new emission factor in a calculation results in a source being out of compliance with a permit limit. For this operating permit, the emission factors or emission factor equations included in the permit are considered to be fixed until changed by the permit. Factors dependent of the fuel sulfur content or heat content can not be fixed and will vary with the test results. The formula for determining the emission factors is, however, fixed. It is the responsibility of the permittee to be aware of changes in the factors, and to notify the Division in writing of impacts on the permit requirements when there is a change in factors. Upon notification, the Division will work with the permittee to address the situation.

VII. Final Approval for Previously Unpermitted Sources and for Initial Construction Permits

This activity was not issued a Construction Permit. The activity was permitted through a combined construction/operating permit procedure. The Division will not issue a Final Construction Permit for the landfarm. Instead, since these pieces of equipment and activities will have been in operation for more than 180 days by the due date of the first semi-annual monitoring required by the operating permit, the Division will consider the

Responsible Official certification submitted with that report to serve as the self-certification for Final Approval for these sources.