



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

December 15, 2011

In Reply Refer To: WTR-7

Adam Firestone, President
Firestone Brewery
1400 Ramada Avenue
Paso Robles, California 93446

Re: August 9 and 10, 2011 Clean Water Act Inspection

Dear Mr. Firestone:

Enclosed is the December 15th report for our August 9 and 10, 2011 inspection of the Firestone Brewery. Please submit a short response to the findings in Sections 2 through 4, to EPA, the City of Paso Robles, and the California Regional Water Quality Control Board, by **January 30, 2011**. The main findings are summarized below:

- 1** The Firestone Brewery qualifies as a non-categorical significant industrial user ("SIU") discharging to one sewer connection. SIUs are required to be permitted.
- 2** The brewery should comply with many of the Paso Robles local limits because toxics are not expected in brewery wastes. Compliance with the limits for organics, salinity, and nutrients, is not expected although there is now or will be service area-wide remediation for these pollutants. Also high organics levels with acidic conditions could induce city sewer line corrosion. Possible brewery upgrades could include bulk volume fermentation biotreatment, membrane filtration, final pH adjustment and increased holding.
- 3** There is no sample record for the Firestone Brewery. Self-monitoring should involve daily indicator measurements (pH, EC, discharge flow rate), and at least twice-per-year sampling for organics, salinity, and nutrients.

I appreciate the helpfulness of your staff extended to me during this inspection. I am available to the City of Paso Robles, and to you to assist in any way. Please do not hesitate to call me at (415) 972-3504 or e-mail at arthur.greg@epa.gov.

Sincerely,

Original signed by:

Greg V. Arthur
CWA Compliance Office

Enclosure

cc: Patti Gwathmey, Industrial Waste Manager, City of Paso Robles
Sorrel Marks, Central Coast RWQCB



U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION REPORT

Industrial User: Firestone Walker Brewing Company
1400 Ramada Avenue, Paso Robles, California 93446
Non-Categorical Significant Industrial User

Treatment Works: City of Paso Robles Wastewater Treatment Plant
NPDES Permit No. CA0047953

Pretreatment Program: City of Paso Robles

Date of Inspection: August 9 and 10, 2011

Inspection Participants:

US EPA: Greg V. Arthur, Region 9, CWA Compliance Office, (415) 972-3504

Central Coast RWQCB: None.

City of Paso Robles: Patti Gwathmey, Industrial Waste Manager, (805) 227-1654

Paris Precision: Adam Firestone, Owner, (805) 238-2556
Matthew Brynildson, Partner and Brewmaster, (805) 227-1654

Report Prepared By: Greg V. Arthur, Environmental Engineer
December 15, 2011



1.0 Scope and Purpose

On August 9 and 10, 2011, EPA and the City of Paso Robles conducted a compliance evaluation inspection of the Firestone Walker Brewing Company in Paso Robles, California (Firestone Brewery). The purpose was to ensure compliance with the Federal regulations covering the discharge of non-domestic wastewaters into the sewers. In particular, it was to ensure:

- Classification in the proper Federal categories;
- Application of the correct standards at the correct sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

The Firestone Brewery is a significant industrial user ("SIU") within sewer service areas administered by the City of Paso Robles whose compliance was assessed as part of the 2011 EPA audit of the Paso Robles pretreatment program. The inspection participants are listed on the title page. Arthur conducted the inspection. Photo documentation of this inspection follows in Section 1.6 on page 5.

1.1 Process Description

The Firestone Brewery manufactures beer. The Firestone Brewery receives grain by truck to silos. The manufacturing steps first involve hot mashing of crushed grain and R/O water in order to break starches down to sugars through the enzymatic reaction of saccharification. Lauter separation of the wort (sugar water) from the spent grain occurs first through hot water rinsing and filtered draining, followed by evaporative thickening through boiling, hydrocycloning to extract the remaining wort from the spent grain, and chilling. The manufacturing then involves the yeast fermentation of the wort into beer followed by diatomaceous earth filtering, maturation and settling through cellar storage, and final packaging. EPA did not determine whether the grain is malted (germinated and heat-dried) or if it arrives malted, nor where in process hops are added.

The Firestone Brewery began operations on-site in 2001 after obtaining the brewery out of bankruptcy from San Luis Obispo Brewing Company. The Firestone Brewery consists of three main production areas (cellar bank fermentation tanks, brewhouse, packaging), ingredient storage, and water preconditioning, which involves city water storage in two 10,000 gallon tanks, granular activated carbon, intermittent water softening, reverse osmosis, and RO conditioned water storage for brewing in two 20,000 gallon tanks.

1.2 Facility SIC Code

The Firestone Brewery is assigned the SIC codes for the manufacturing malt beverages (SIC 2082).



1.3 Facility Wastewater Sources and Handling

The City of Paso Robles has not issued a permit to the Firestone Brewery for its non-domestic process-related wastewater discharges into the Paso Robles sewers. There is a single non-domestic discharge into one sewer connection, designated in the report as IWD-FRS.01. The Firestone Brewery allowed photographs of the wastewater sources and drains in the production area but did not give permission to photograph the water preconditioning and wastewater treatment units.

Wastewater Sources - The production area primarily consists of ceramic flooring and stainless steel tanks, piping, and equipment. See Photos #1, #2, and #3 in Section 1.6 of this report on page 5.

- Clean-in-Place: Separate clean-in-place (“CIP”) units automatically clean and disinfect the plant and equipment in three areas -- the cellar bank, the brew-house, and the packaging area. The CIP units involve programmed automatic flushing of the plant and equipment with caustic alkaline cleaner, nitric-acid and phosphoric-acid cleaners, foaming bleach disinfectant, an organic peroxide sanitizer, and interspersed water rinses. The cleaners and disinfectants return to the CIP units which then periodically waste spents to the floor drains. The CIP rinses waste to the floor drains at their point of use.
- Plant and Equipment Washdown: Portable foaming chlorinated cleaner is used on the external surfaces of the tanks with the drainage and wash down to the floor drains. All other drainages from the cleaning of the plant and equipment also wash down to floor drains.
- Fermentation: Backwash from the diatomaceous earth filtration of fermentation products drains to the floor drains.
- Water Preconditioning: Reverse osmosis backwash drains to the sewers through inlet drains. The other water preconditioning steps do not generate tail waters.

Delivery – All process-related wastewaters drain through floor drains for hard piped delivery to a wastewater treatment unit for discharge to the sewers. See Photo #4 in Section 1.6 of this report on page 5.

Composition – The production-related wastewaters collected for treatment and discharge to the sewers would be expected to contain soluble organics (BOD), solids (TSS), dissolved solids (salinity, mineral scale), CIP cleaners (acidity, surfactants, phosphates, nitrates), and disinfectants (chlorinated surfactants, peroxide). Metals and other toxics would not be expected although corrosion inhibitors could contain quaternary salts, selenium, molybdenum, and other pollutants.

Treatment – There is minimal treatment. The wastewater treatment unit comprises a small 5,000 gallon underground clarifier, sieve filter columns, and a small 10,000 gallon test-prior-to-discharge holding tank. The final holding tank includes an automatic on/off



valve responding to a pH meter for either the impoundment of out-of-spec wastewaters or the discharge of in-spec flows.

Discharge – All non-domestic process-related wastewaters from the Firestone Brewery drain through a single sewer connection into the Paso Robles domestic sewers. The City of Paso Robles has not issued a permit as of yet. The final discharge point to the sewer is designated in this report as IWD-FRS.01. The specific location of the compliance sampling point is identified as the outlet of the final holding tank.

Residuals – The Firestone Brewery generates a number of non-hazardous residuals for off-site reuse and disposal. The brewhouse spent grain and hydrocyclone solids are collected for agriculture reuse by stockyards or farms. Tank bottoms and yeast spents are collected to a trub tank for reuse as cattle feed. Spent diatomaceous earth filter media is off-hauled to a landfill or farm. The water preconditioning unit generates spent activated carbon. The wastewater treatment unit generates only an unspecified amount of sieve filter and clarifier solids.

1.4 Sampling Record

The Firestone Brewery does not self-monitor since Paso Robles has not issued a permit for the discharge to the sewers. The City of Paso Robles also does not collect its own samples.

1.5 POTW Legal Authorities

The City of Paso Robles has enacted an ordinance to implement a pretreatment program in the areas serviced by the City's wastewater treatment plants. Under this authority, the City can issue a permit to authorize the discharge of non-domestic wastewater from significant industrial users to the sewers. Neither EPA nor the RWQCB have reviewed and issued an approval of the pretreatment program.



1.6 Photo Documentation

Four of the five photographs taken during this inspection are depicted below and saved as *firestone-01-080911.jpg* through *firestone-05-080911.jpg*.



Photo #1: CIP Main System
Taken By: Greg V. Arthur
Date: 08/09/11



Photo #2: Portable Foaming Disinfection Unit
Taken By: Greg V. Arthur
Date: 08/09/11



Photo #3: CIP Inlet / Outlet / Connector Lines
Taken By: Greg V. Arthur
Date: 08/09/11



Photo #4: Brewhouse Floor Drains
Taken By: Greg V. Arthur
Date: 08/09/11



2.0 Sewer Discharge Standards and Limits

Federal categorical pretreatment standards (where they exist), national prohibitions, State groundwater, and the local limits (where they exist) must be applied to the sewer discharges from industrial users. (40 CFR 403.5 and 403.6).

Summary

The Firestone Brewery qualifies as a non-categorical significant industrial user. No Federal categorical pretreatment standards apply although the national prohibitions do apply. The City of Paso Robles has not issued a permit but their local limits do apply to the discharge from the Firestone Brewery. These local limits were technically-based as protective of the Paso Roble WWTP but were not reviewed and approved by either EPA or the RWQCB as part of a formal pretreatment program approval. The application of Federal standards, national prohibitions, and local limits was determined through visual inspection. See Appendix 1 on page 13 of this report for the applicable permit limits.

Requirements

- Any significant industrial user must be issued a permit authorizing discharge to any publicly-owned sewer systems.

Recommendations

- Any permit should require self-monitoring for the discharge flow rate.
- Any permit must apply the Federal bypass provision which prohibits the bypassing of any treatment necessary to comply with Federal standards and local limits.

2.1 Classification by Federal Point Source Category

The discharges from the Firestone Brewery do not qualify for regulation under any Federal categorical pretreatment standard in 40 CFR 403-471. The Firestone Brewery does qualify as a non-categorical significant industrial user.

Significant Industrial User – The Firestone Brewery qualifies as a significant industrial user under the definitions in 40 CFR 403.3 because the discharge flow rates can exceed 25,000 gallons per day and the pollutant loadings are potentially great enough to pose a risk of adversely impacting the sewage collection system. The Firestone Brewery representatives informed the EPA inspector that (1) the brewery operates around the clock, (2) it discharges 20,000 to 30,000 gallons per day to the sewer, and (3) the organic strength of the discharge ranges 350 to 2,500 mg/l BOD. Significant industrial users are required to self-report compliance at least twice per year.



2.2 Local Limits and National Prohibitions

Local limits and the national prohibitions are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants and their receiving waters from adverse impacts. In particular, they prohibit discharges that can cause the pass-through of pollutants into the receiving waters or into reuse, the operational interference of the sewage treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. The national prohibitions apply nationwide to all non-domestic sewer discharges.

The Paso Robles local limits apply to non-domestic discharges in the service areas of the city wastewater treatment plant and are implemented through City permits.

2.3 Federal Prohibitions

The Federal standards in 40 CFR 403.17(d) prohibit the bypassing of any on-site treatment necessary to comply with standards, respectively. This provision does not currently apply because all non-domestic wastewaters discharge untreated.

2.4 Compliance Sampling and Point(s) of Compliance

Any permit issued for the Firestone Brewery discharge to the sewers should designate the final holding tank as the location of the compliance sampling point (designated in this report as IWD-FRS.01).

Federal Standards – There are no Federal categorical pretreatment standards that apply to the wastewater discharge to the sewers.

Local Limits - Local limits and the national prohibitions apply end-of-pipe to non-domestic flows. The sample point, IWD-FRS.01, is an end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges from the Firestone Brewery.

Sampling Protocols – The national prohibitions and local limits are instantaneous-maximums comparable to samples of any length. City of Paso Robles permits specify the sampling protocols by parameter. See Section 4.0 on page 12 and Appendix 1 on page 13.



3.0 Compliance with Local Limits and National Prohibitions

All non-domestic wastewater discharges to the sewers must comply with local limits and the national prohibitions. 40 CFR 403.5(a,b,d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

Summary

The Firestone Brewery should consistently comply with local limits for metals, cyanide, and toxic organics, because toxics are not expected in brewery wastes. Current BOD levels with possible low pHs from the CIP acid steps could induce sewer line corrosion. Consistent compliance is not expected with the local limits for BOD, total dissolved solids, sodium, sulfates, chlorides, and potentially ammonia, although there is now or will be service area-wide remediation for organics, salinity, and nutrients. There is no sample record for the Firestone Brewery to verify the quality of discharge.

Requirements

- None.

Recommendations

- Consistent pH control would require either (1) final pH adjustment, or (2) the operation of a holding tank to impound and cease discharge of 24 hours of peak flow.
- Consistent on-site control of organics and nutrients would require installation of some form of biotreatment such as anaerobic bulk volume fermentation.
- Consistent on-site control of salinity would require installation of some form of membrane filtration such as reverse osmosis, or ultrafiltration with permeate reclaim.
- Any wastewaters generated by the chemical boil-out servicing of heat exchangers and boilers should not be discharged to the sewers.

3.1 National Objectives

The general pretreatment regulations were promulgated in order to fulfill the national objectives to prevent the introduction of pollutants that:

- (1) cause operational interference with sewage treatment or sludge disposal,
- (2) pass-through sewage treatment into the receiving waters or sludge,
- (3) are in any way incompatible with the sewerage works, or
- (4) do not improve the opportunities to recycle municipal wastewaters and sludge.



This inspection did not include an evaluation of whether achievement of the national objectives in 40 CFR 403.2 have been demonstrated by the Paso Robles wastewater treatment plant through consistent compliance with their sludge and discharge limits.

3.2 Sampling Results

There is no sample record for the discharge of non-domestic wastewaters to the sewers from Firestone Brewery. There are no flow rate results and Paso Robles does not collect its own samples. Therefore a determination of consistent compliance cannot be made.

3.3 Adequacy of Wastewater Treatment and Disposal

Current Permitting - No best-available-technology treatment has been defined by Federal rule for brewery discharges to sewers because their wastewaters are treatable by domestic sewage treatment plants and salts are not toxic. Also treatment is unnecessary to comply with local limits for metals, cyanide, or toxic organics because breweries are not expected to generate and discharge toxic pollutants. However, current BOD levels with possible low pHs from the CIP acid steps could induce sewer line corrosion, and the design and performance of treatment at the Firestone Brewery is inadequate to consistently comply with other Paso Robles local limits for BOD, TDS, sodium, sulfates, chlorides, and potentially ammonia.

The good aspects of (+) and deficiencies with (-) the existing wastewater treatment and disposal are listed below.

- + Collection of all process-related wastewaters to floor drains and hard piping for discharge through a single sewer connection.
- + Testing for pH prior to discharge.
- + Source water preconditioning through reverse osmosis which precludes the extensive use of water softening and the associated introduction of salts.
- Treatment and handling that is not designed to remove dissolved solids.
- Insufficient final equalization that does not attenuate organics mass loading peaks.
- No final pH adjustment even though discharges are variable in nature.

Therefore, if through permitting, Paso Robles does require compliance with the current local limits, the specific determination of what constitutes the best-available-technology treatment to meet local limits at the Firestone Brewery would likely involve both bio-treatment and salts removal, perhaps through anaerobic bulk volume fermentation, membrane filtration, and the reclaim of low-TDS treated wastewaters into the source water preconditioning.

Future Permitting - There is now, or will be in the near future, remediation of the aggregate service area-wide loadings of organics, salinity, and nutrient into the Paso Robles sewage treatment plant. As a result, the technical basis for the local limits which are protective of the Paso Roble WWTP is likely to be re-determined for these pollutants.



- Organics - The Paso Robles sewage treatment plant currently has the capacity to treat the service area-wide organics loadings into the plant. The Firestone Brewery accounts for almost 10% of the total incoming organics loadings, and thus has a slight potential to effect the treatment plant operations.
- Salinity - Salinity issues in San Luis Obispo County stem from the service area-wide use of water softeners. As a result, Paso Robles and other communities, under a State of California RWQCB Time Schedule Order, are constructing a surface water treatment plant and delivery pipeline for low-hardness water from Lake Nacimiento. The new water supply, expected on-line in 2015, should result in relaxed local limits for salinity.
- Nutrients - The Paso Roble sewage treatment currently does not provide removal of the nutrients generated by domestic and non-domestic sources service area-wide. A second State of California RWQCB Time Schedule Order requires Paso Robles to upgrade the treatment plant by 2016 to remove nutrients.

3.4 Local Limits for Oxygen Demanding Pollutants and The National Prohibition Against Interference

Metals and Cyanide – Toxic pollutants would not be expected in the Firestone Brewery wastewaters, and thus should not cause an operational interference of the Paso Robles sewage treatment plant through the toxic inhibition of the aerobic biodegradation and anaerobic digestion. However, the boil-out of heat exchangers and boilers, if serviced on-site, will generate wastewater spents with levels of copper high enough to adversely impact the treatment plant operations.

High-Strength Organics - The organics mass loadings from the Firestone Brewery account for at most just under 10% of the incoming loads into the Paso Robles sewage treatment plant. As a result, the mass loading discharges to the sewers are likely not large enough to pose a risk of operational interference at the treatment plant from overloading.

Salinity – Sulfates, chlorides, and alkali metals are not inhibitors of sewage treatment plant operations.

3.5 Local Limits for Toxic Metals, Cyanide, Salinity, and Other Pollutants and The National Prohibition Against Pass-Through

Metals and Cyanide – Toxic pollutants would not be expected in the Firestone Brewery wastewaters, and thus should not result in the pass-through of pollutants from the Paso Robles wastewater treatment plant to the receiving waters. However, the boil-out of heat exchangers and boilers, if serviced on-site, could generate wastewater spents with levels of copper high enough to pass-through the treatment plant to the receiving waters.



Conventional Pollutants – Pass-through of conventional pollutants cannot occur because the Paso Robles wastewater treatment plant treats for them.

Salinity and Minerals – There are two principal sources of added salinity: (1) generated salts from the CIP cleaning agents and their subsequent neutralization, and (2) brines from the infrequent water softener use. Source water preconditioning is not a source of added salinity since reverse osmosis only discharges as reject the minerals already present in the city water. Removal of dissolved solids would require some form of membrane filtration such as hollow-tube ultrafiltration, or reverse osmosis. Salinity from softeners should no longer be a water quality issue upon start-up of the low-hardness municipal water supply.

3.6 Local Limits for pH and Sulfides, and The National Prohibitions Against Safety Hazards and Corrosive Damage

Corrosion - Sewer collection system interferences related to the formation of hydrogen sulfide and the resulting acidic disintegration of the sewers are not expected but are possible. The wastewaters discharged to the sewers are high strength in biodegradable organics and have the potential to be acidic in salty and thus heavily buffered discharges.

Flammability - Flammability would not be expected because sampling shows that the discharges to the sewer would entrain negligible amounts of volatile organics.



4.0 Compliance with Federal Monitoring Requirements

Significant industrial users must self-monitor for all regulated parameters at least twice per year unless the sewerage agency monitors in place of self-monitoring. 40 CFR 403.12(e) & 403.12(g).

Each sample must be representative of the sampling day's operations. Sampling must be representative of the conditions occurring during the reporting period. 40 CFR 403.12(g) and 403.12(h).

Summary

The Firestone Brewery has no self-monitoring requirements since Paso Robles has not issued a permit. Any sampling following the final holding tank at IWD-FRS.01 should be representative of the discharge to the sewers over both the sampling day and the six-month reporting period because all process-related wastewaters discharge through one sewer connection.

Requirements

- None.

Recommendations

- See Appendix 1 on page 13 of this report for the self-monitoring and city monitoring requirements for that would be considered to be representative of the discharges.
- Flow, EC and pH should be self-monitored daily or even continuously as indicators of treatment performance.



Appendix 1

Sewer Discharge Standards and Limits for the Firestone Brewery

Pollutants of Concern	Fed stds (d-max)	nat prohib (instant)	local limits (inst/dmax)	monitoring frequency ①				
				IWD-FRS.01				Paso Robles

Toxic Metals and Cyanide

cadmium (mg/l)	-	-	0.10	③				-
chromium (mg/l)	-	-	3.70	③				-
cobalt (mg/l)	-	-	0.075	③				-
copper (mg/l)	-	-	0.30	2/year				1/year ④
molybdenum (mg/l)	-	-	1.10	③				-
nickel (mg/l)	-	-	1.90	③				-
selenium (mg/l)	-	-	0.27	③				-
zinc (mg/l)	-	-	4.00	③				-
total cyanide (mg/l)	-	-	0.01	③				-

Conventional Pollutants and Parameters

pH (s.u.)	-	<5.0	6.0-9.0	1/day				1/year
flow rate (gpd)	-	-	-	1/day				-
BOD (mg/l)	-	-	360	2/year				1/year ④
TSS (mg/l)	-	-	360	2/year				1/year ④
ammonia (mg/l)	-	-	20.0	2/year				1/year ④
oil & grease (mg/l)	-	-	100	③				-
temperature (°F)	-	-	150°F	③				-
explosivity	-	<140°F ②	<140°F ②	③				-

Dissolved Salts

EC (µmhos/cm)	-	-	-	1/day				1/year
TDS (mg/l)	-	-	1000	2/year				1/year ④
boron (mg/l)	-	-	5.0	③				-
chloride (mg/l)	-	-	150	2/year				1/year ④
sodium (mg/l)	-	-	200	2/year				1/year ④
sulfate (mg/l)	-	-	200	2/year				1/year ④

① Recommended reductions in green. Recommended increases in RED.

② Closed-cup flashpoint.

③ As part of periodic priority pollutant scans in order to identify changes in discharge quality.

④ Twice -per year city monitoring could replace two self-monitoring samples per year.