



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Jan 07, 2004

In Reply Refer To: CWA-307-9-03-013

Marc Sulik, Wastewater Treatment Supervisor
City of Chico
Water Pollution Control Plant
4827 Chico River Road
Chico, California 95927

Re: 2004 Pretreatment Program Evaluation

Dear Mr. Sulik:

Enclosed is the December 15, 2004 report for our pretreatment evaluation of Chico. We ask that the City provide short written responses to each of the findings in Sections 2.0 to 8.0 of this inspection report by March 30, 2005.

We found your pretreatment program to be competently well run and very efficient and effective in regulating the many non-domestic wastewater contributions into the Chico treatment works. In particular, the Chico Water Pollution Control Plant consistently complies with its discharge and sludge limits, and we would not expect the WPCP to experience any pass-through, operational interference, or sludge contamination. In addition, the permits accurately convey the sewer discharge requirements to the industrial user and through the inspections and sampling work Chico demonstrates a thorough knowledge of the pretreatment program requirements. A small handful of minor corrections involve preparing permit fact sheets, revising the significant industrial user inventory and reissuing a few permits. All of the findings, requirements, and recommendations are outlined in the enclosed inspection report.

Thank you for your cooperation during and after this inspection. Please do not hesitate to call (415) 972-3504 or e-mail arthur.greg@epa.gov.

Sincerely yours,

Original signed by:
Greg V. Arthur

Greg V. Arthur
Clean Water Act Compliance Office

cc: Melissa Hall, RWQCB



U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

PRETREATMENT PERFORMANCE EVALUATION INSPECTION REPORT

NPDES Permittee: City of Chico
4627 Chico River Road, Chico, California 95927
Wastewater Treatment Plant (NPDES CA0079081)
WDRs Order R5-2004-0073

Dates of Inspection: June 10-11, and July 6, 2004

Data Review: Influent and Effluent Conventional: 2003 – 2004
Influent and Effluent Toxics: 2001 – 2004
Sludge Toxics: 2000 – 2004

Inspection Participants:

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

RWQCB: No Representative

Chico: Marc Sulik, Wastewater Treatment Supervisor, (530) 895-4965
Ron Manwill, Industrial Waste Inspector, (530) 895-4967

Industrial Users: Wrex Products, Wayne Mullin, Safety Coordinator, (530) 895-3838
Lares Research, Larry McCulloch, Mfg Engr Mgr, (530) 345-1767
Aero Union, Jeff Parrish, Director Safety Envr & Fac, (530) 896-3000
Chico Drain and Oil, Michael Chiotti, Ops Mgr, (530) 345-9043
Sierra Nevada Brewery, Steve Strukan, Maint Suprvsr, (530) 893-3520
A/C Industrial Services, Darcy Auer, Business Mgr, (530) 343-5488

Report Prepared By: Greg V. Arthur, Environmental Engineer
December 15, 2004

Section 1

Introduction and Background

1.0 Scope and Purpose

In October 2004, EPA completed a performance evaluation of the regulatory control of non-domestic wastewaters discharged into the City of Chico's Water Pollution Control Plant (WPCP). This performance evaluation is one of a series of reviews of small publicly-owned treatment works that accept non-domestic contributions, many of which are not large enough to be mandated to operate EPA-approved pretreatment programs. Chico is large enough and received pretreatment program approval on June 11, 1999.

The scope of this performance evaluation comprised:

- Sampling inspection of the Chico water pollution control plant on July 6, 2004;
- Review of 12-months of Chico self-monitoring reports (June 2003 to May 2004);
- Review of the 2000-2004 influent and effluent sampling records for toxic pollutants;
- Inspections of 4 significant industrial users and 2 non-SIUs, of which 3 were sampled;
- Review of the 2000-2004 sampling records for the significant industrial users inspected;
- Interviews with City representatives on June 10-11, and July 6, 2004;
- Review of the responses by the industries to their inspection reports and follow-up visits.

The purpose of this evaluation was to determine if non-domestic discharges into the Chico sewer system are properly controlled. The evaluation findings were measured against two fundamental performance objectives. The first is the prevention of sewage treatment works pass-through, interference and sludge contamination as shown by compliance with the Federal sludge limits, the discharge permit limits, and any expected future Clean Water Act requirements. The second is the consistent compliance by the industrial users with their own Clean Water Act requirements, in particular with the Federal best-available-technology standards that apply to certain industrial categories, and any national prohibitions and local limits for pollutants associated with treatment works non-compliance.

This report covers the performance of the pretreatment program as it currently exists in Chico. Some pertinent findings from the industrial user inspections are also incorporated. The significant industrial users received individual reports. Arthur collected samples on June 11 and July 6, 2004 for delivery to the EPA Richmond Lab.

1.1 Chico Water Pollution Control Plant

The Chico WPCP nitrification/partial-denitrification plant that discharges by a 1½-mile long outfall to the Sacramento River or, in an emergency, to the M&T irrigation canal particularly

Section 1 – Introduction and Background

if it is in use during the summer growing season. The wastewater treatment plant has a dry-weather design capacity of 9.0 million gallons per day (“mgd”) and a wet-weather design capacity of 22.5 mgd. The average and calculated peak flows were 6.96 and 9.55 mgd over the twelve-month period from June 2003 through May 2004. See Appendix 1.

- Primary Treatment – The headworks, which provide screening, aerated grit removal, and odor control through chemical addition, is followed by three primary sedimentation basins that together have a design capacity of 22.5 mgd. Primary effluent is then split between two parallel activated treatment plants.
- Secondary and Advanced Treatment – The older Plant 1, which has a design capacity of 3.5 mgd, consists of aeration basins followed by secondary clarification and chlorine contact disinfection. Plant 1 is operated in an extended aeration mode to provide nitrification and the side benefit of partial denitrification. The newer Plant 2, which has a design capacity of 5.5 mgd, consists of four oxidation ditch raceways followed by secondary clarification and chlorine contact disinfection. Plant 2 is operated at a constant feed rate, in an extended aeration mode to provide nitrification, and with anoxic dead zones to provide denitrification. In both Plant 1 and Plant 2, activated sludge returns to aeration at rates to support a mean cell residence time of between 6 to 8 days during the summer.
- Tertiary Treatment - There is no tertiary polishing of secondary effluent and, as a result, no capability to reuse treated wastewater off-site.
- Solids Handling - Waste secondary activated sludge and primary sludge are digested in two anaerobic digesters operated in parallel. Waste activated sludge is first conditioned through two dissolved air flotation units with the float further prepared through a sludge thickener before feeding into the digesters. Primary sludge is preconditions in the sludge thickener. Digested sludge is discharged through a storage equalization tank for application on sludge drying beds. Dried sludge, headworks grit, and screenings are hauled-off site to a landfill. Dissolved air flotation subnatant, and sludge thickener decant return to the flow splitter into Plant 1 and Plant 2.
- WPCP Sampling - The influent sampling point, located between the headworks and the primary sedimentation basins, is designated as IWD-CH1 for the purposes of this report. All return flows rejoin treatment downstream of influent sampling. The effluent compliance sample point, sited immediately before dechlorination in the outfall, is designated as IWD-CH2. The accumulation of digested sludge in an equalization tank before sludge drying is designated as the sludge sampling point, IWD-CH3, although dried sludge better represents the quality of the sludge hauled off-site for disposal. The receiving water sampling points upstream and downstream of the Chico outfall in the Sacramento River are designated in the permit as R-1 and R-2.

Section 1 – Introduction and Background

- Water Supply – The California Water Service Company provides well water to users in Chico. The water supply is more mineralized than the receiving waters for the sewage treatment plant, with the average total dissolved solids content of the ground water more than double the content downstream in the Sacramento River (199 versus 94 mg/l). The water supply is also significantly much higher in zinc (10 versus 1 µg/l), copper (280 versus 2 µg/l), and nitrates (12 versus 0.2 mg/l), but lower in iron (2 versus 13 µg/l). Corrosion of household plumbing is the likely principal source of the increased copper and possibly zinc. Farm-related run-off and septic systems are the likely principal sources of the elevated nitrate levels found throughout Butte County. The elevated nitrate levels have precluded significant areas of Butte County in and around Chico from the installation and continued use of septic systems. See Appendix 2.
- Receiving Water Hardness - The USGS maintains stations on the Sacramento River at Colusa and near Red Bluff, respectively ~50 river miles downstream and ~50 river miles upstream of the Chico outfall. These stations and five others in the Sacramento River basin were extensively sampled under a full range of conditions for conventional, toxic, and pesticide related pollutants, as part of the 1995-1998 National Water Quality Assessment Program. The calculated 99th% minimum and sample minimum hardness for the Sacramento River stations were 37.7 and 40 mg/l as CaCO₃ upstream at Red Bluff and 35.1 and 40 mg/l downstream at Colusa. The calculated 99th% minimum and sample minimum hardness reported by Chico were 37.5 and 46 mg/l for the mixing zone around the outfall. The toxic metals limits in the WDRs were based on a minimum receiving water hardness of 46 mg/l. A lower minimum of hardness of 37.5 mg/l would not significantly lower the toxic metals limits in the WDRs.

1.2 Sewer Service Area

The Chico sewer service area comprises the incorporated area of the city and small parcels of unincorporated Butte County. The Chico WPCP does not accept septage. The regional disposal points for septage collected from Butte County are the Oroville Wastewater Treatment Plant and the ponds at the Neal Road Landfill. The service area has a population in 2000 of roughly 70,000 people, and roughly 500 commercial and industrial users, who together contribute 10% of the sewerage wastewater. The largest industrial user contributes around 4% of the total flow and 10% of the total organic loadings. The inventory of industrial users includes at least seven considered as significant industrial users, who together discharged an average of 340,000 gallons per day into the sewers (5% of the total flow).

1.3 Discharge Requirements

Chico is authorized by the June 4, 2004 RWQCB Waste Discharge Requirements, Order R5-2004-0073, (“WDRs”), to discharge treated sewage from the Chico WPCP either to the Sacramento River or to the M&T Canal, an irrigation ditch. The WDRs also function as National Pollutant Discharge Elimination System (“NPDES”) permit CA0079081. The

Section 1 – Introduction and Background

WDRs contain narrative prohibitions, effluent limits that implement the California Toxics Rule, receiving water limitations, monitoring requirements, pretreatment provisions, and sludge disposal requirements. The effluent limitations are for conventional pollutants, total coliform, residual chlorine, pH, acute biotoxicity, and a few selected toxic metals (copper, lead, zinc) and toxic organics (dibromochloro-methane and bromodichloromethane). The effluent limits for toxics are based on three sets of dilution credits for acute and chronic toxicity and human health that differ depending on the discharge point and time of year (M&T Canal – Apr 15 to Dec 15; M&T Canal – Dec 16 to Apr 14, Sacramento River – year round). The effluent limits for toxic metals are based on a receiving water hardness of 46 mg/l.

The receiving water limitations include narrative provisions against causing dissolved oxygen concentrations below 9.0 mg/l, detectible chlorine, a visible film, discoloration, objectionable growths, nuisance conditions, the bioaccumulation of toxics, bad tasting fish, increased temperatures over 5°F, increased turbidity, increased specific conductivity, high or low pH's, and any other adverse effect on the beneficial uses of the receiving waters.

1.4 Legal Authorities

Chico obtained approval of its pretreatment program in 1999. Chico operates under the authority of Title 15, Water and Sewers, Chapters 15.36 and 15.40 of its municipal code as adopted in March 2000. The current WDRs and the WDRs previously issued in 1999 imposed pretreatment provisions that require implementation of the regulatory controls necessary to enact all of 40 CFR 403. Requirements to implement an approved pretreatment program would include the following:

- The implementation of the general and specific national prohibitions in 40 CFR 403.5 for industrial users against the introduction of incompatible wastewaters;
- The requirement in 40 CFR 403.5 to develop locally-determined limits necessary to protect the treatment works from potential adverse impacts, such as operational interference, worker health and safety risks, the pass-through of pollutants to the receiving waters, and sludge contamination;
- The performance of the program functions set forth in 40 CFR 403.8, such as identifying industrial users, issuing permits, inspecting and sampling industrial users, providing adequate funding, and enforcing against violators;
- The requirement to enforce the prohibition against bypassing treatment necessary to comply with standards in 40 CFR 403.17 and against dilution as a substitute for treatment in 40 CFR 403.6(d);
- The implementation of an industrial users self-monitoring program under 40 CFR 403.12;
- The implementation of Federal categorical standards under 40 CFR 403.6; and
- The enacting of the local legal authorities necessary to operate an approved pretreatment program under 40 CFR 403.8.

This evaluation did not involve a review of the approved 1999 ordinance because there have been no changes in the Federal pretreatment regulations.

Section 2

Wastewater Treatment Plant Performance

The Chico WPCP must meet permit effluent limits for conventional pollutants, metals, toxic organics, pH, residual chlorine, and biotoxicity. 40 CFR 403.5(a,b,c) and 403.6.

Non-domestic wastewaters may not result in unpermitted releases, hazardous or explosive conditions with the sewers, or operational interferences in the collection system. 40 CFR 403.5(b).

2.0 Summary

The WPCP has the capacity and capability to handle the domestic wastewaters in the Chico service area. At current loadings, removal rates, and with current disinfection methods, the WPCP should continue to not experience any interference or pass-through, primarily because of dilution in the river mixing zone, and because there has been just one discharge to the M&T Canal over the past 20 years. Because of nitrification and partial denitrification, the WPCP is not expected to experience the pass-through of toxicity associated with ammonia.

See Appendices Nos. 2, 3 and 4 for wastewater and sludge summaries, 5 for a comparison of Chico with other selected Central Valley sewer districts with industrial contributions, 6 for the EPA sampling results, and 8 for the definitions of ‘pass-through’ and ‘interference’.

Requirements

- All process wastewaters from the Sierra Nevada Brewery must be thoroughly treated in its on-site BVF bioreactor prior to discharge to the sewer.

Recommendations

- The wastewater treatment plant influent should be regularly monitored for aluminum, chromium, copper, iron, lead, mercury, molybdenum, selenium, and zinc.
- The permit for the Sierra Nevada Brewery should specifically prohibit the bypassing of the on-site treatment or require prior notice and approval by the City of Chico.
- A newsletter should inform rate payers of the wastewater compliance status and the on-going need to fund the capital improvements, pretreatment, and operations to protect and maintain the public wastewater investment.

Section 2 – Wastewater Treatment Plant Performance

2.1 Conventional Pollutants

The WPCP produces high-quality secondary-treated wastewaters that are fully nitrified and partially denitrified. As a result, the WPCP consistently complies with its permit limits for conventional pollutants. The averages and calculated 99th% peaks are 4.6 and 9.0 mg/l BOD and 5.0 and 14.4 mg/l TSS. There were also no instances of the effluent pH below the lower 6.0 limit or above the upper 9.0 limit.

2.2 Ammonia Toxicity

The permit sets acute toxicity, and maximum pH limits, as well as temperature increase limits for the receiving waters, that together in effect limit effluent ammonia. The WPCP consistently meets permit limits for acute toxicity (single events and 3-sample medians) and for maximum pH. Compliance with the toxicity limits is the result of nitrification through extended aeration. Total ammonia concentration averages and calculated 99th% peaks were only 0.40 and 3.0 mg/l, which is well below the 10-40 mg/l found in un-nitrified effluent. Moreover, only a minute fraction of the ammonia, less than 5 µg/l, would be expected to be in the toxic un-ionized form since just one of the 366 pH measurements over the 12-month period from June 2003 to May 2004 exceed 7.5 s.u.

2.3 Nitrates Plus Nitrites

The WPCP nitrifies ammonia to nitrates and partially denitrifies nitrates to nitrogen. It does not denitrify enough to keep levels below the 10 mg/l threshold that could trigger adding nitrates as a pollutant of concern for the receiving waters. The two sample results from June 2003 to May 2004 for nitrate/nitrites as nitrogen were 13.8 and 19.9 mg/l. The dilution credits are high enough to ensure there is little potential to exceed 10 mg/l outside of the 250' x 70' mixing zone in the river. At the USGS stations on the Sacramento River, nitrate/nitrites were well under the 10 mg/l threshold, with averages and calculated 99th% peaks of 0.12 and 0.23 mg/l upstream at Red Bluff and 0.16 and 0.34 mg/l downstream at Colusa.

2.4 Salts

The WDRs do not limit salts but requires monitoring for total dissolved solids, hardness, and electrical conductivity. The monitoring results for salts are all well below what could adversely impact reuse, water supplies, or in the case of sulfate, impart an acute toxicity.

2.5 Toxic Metals

At current loadings and removal rates, the WPCP would be expected to consistently comply with the WDRs limits for aluminum, copper, and zinc. The WDRs advance no limits for

