# National Pretreatment Program

## (40 CFR 403)

## Controlling Fats, Oils, and Grease Discharges from Food Service Establishments


**Summary**

The National Pretreatment Program provides regulatory tools and authority to state and local POTW pretreatment programs for eliminating pollutant discharges that cause interference at POTWs, including interference caused by the discharge of Fats, Oils, and Grease (FOG) from food service establishments (FSE). More specifically, the Pretreatment Program regulations at 40 CFR 403.5(b)(3) prohibit "solid or viscous pollutants in amounts which will cause obstruction" in the POTW and its collection system.


### What is the environmental problem with FOG discharges into sewers?

EPA's Report to Congress on combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs) identified that "grease from restaurants, homes, and industrial sources are the most common cause (47%) of reported blockages. Grease is problematic because it solidifies, reduces conveyance capacity, and blocks flow." See Impacts and Controls of CSOs and SSOs, EPA-833-R-04-001, August 2004.

Controlling FOG discharges will help POTWs prevent blockages that impact CSOs and SSOs, which cause public health and water quality problems. Controlling FOG discharges from FSEs is an essential element in controlling CSOs and SSOs and ensuring the proper operations for many POTWs. The interference incidents identified in CSO/SSO report to Congress may indicate the need for additional oversight and enforcement of existing regulations and controls. See 71 FR 76660 (21 December 2006).

## What is the source of FOG at Food Service Establishments?

FOG wastes are generated at FSEs as byproducts from food preparation activities. FOG captured on-site is generally classified into two broad categories: yellow grease and grease trap waste. Yellow grease is derived from used cooking oil and waste greases that are separated and collected at the point of use by the food service establishment.

The annual production of collected grease trap waste and uncollected grease entering sewage treatment plants can be significant and ranges from 800 to 17,000 pounds/year per restaurant.

## What is the legal authority for POTWs to require FSEs to control FOG discharges?

The National Pretreatment Program already provides the necessary regulatory tools and authority to local pretreatment programs for controlling interference problems. Under the provisions of Part 403.5(c)(1) & (2), in defined circumstances, a POTW must establish specific local limits for industrial users to guard against interference with the operation of the municipal treatment works. See 46 FR 9406 (28 January 1981).

Consequently, pretreatment oversight programs should include activities designed to identify and control sources of potential interference and, in the event of actual interference, enforcement against the violator.

## What can FSEs do to control FOG discharges?

Food service establishments can adopt a variety of best management practices or install interceptor/collector devices to control and capture the FOG material before discharge to the POTW collection system.
For example, instead of discharging yellow grease to POTWs, food service establishments usually accumulate this material for pick up by consolidation service companies for re-sale or re-use in the manufacture of tallow, animal feed supplements, bio-fuels, or other products.

Additionally, food service establishments can install interceptor/collector devices (e.g., grease traps) in order to accumulate grease on-site and prevent it from entering the POTW collection system.

## How should FSEs design and maintain their FOG controls?

Proper design, installation, and maintenance procedures are critical for these devices to control and capture the FOG. For example,

- Interceptor/collector devices must be designed and sized appropriately to allow FOG to cool and separate in a non-turbulent environment.
- FSE must be diligent in having their interceptor/ collector devices serviced at regular intervals.

The required maintenance frequency for interceptor/collector devices depends greatly on the amount of FOG a facility generates as well as any best management practices (BMPs) that the establishment implements to reduce the FOG discharged into its sanitary sewer system.

In many cases, an establishment that implements BMPs will realize financial benefit through a reduction in their required grease interceptor and trap maintenance frequency.

## What are some POTWs doing today to control FOG discharges from FSEs?

A growing number of control authorities are using their existing authority (e.g., general pretreatment standards in Part 403 or local authority) to establish and enforce more FOG regulatory controls (e.g., numeric pretreatment limits, best management practices including the use of interceptor/collector devices) for food service establishments to reduce interferences with POTW operations (e.g., blockages from fats, oils, and greases discharges, POTW treatment interference from Nocardia filamentous foaming, damage to collection system from hydrogen sulfide generation).

For example, since identifying a 73% non-compliance rate with its grease trap ordinance among restaurants, New York City has instituted a $1,000-per-day fine for FOG violations.

Likewise, more and more municipal wastewater authorities are addressing FOG discharges by imposing mandatory measures of assorted kinds, including inspections, periodic grease pumping, stiff penalties, and even criminal citations for violators, along with 'strong waste' monthly surcharges added to restaurant

sewer bills. Surcharges are reportedly ranging from $100 to as high as $700 and more, the fees being deemed necessary to cover the cost of inspections and upgraded infrastructure.

Pretreatment programs are developing and using inspection checklists for both food service establishments and municipal pretreatment inspectors to control FOG discharges. Additionally, EPA identified typical numeric local limits controlling oil and grease in the range of 50 mg/L to 450 mg/L with 100 mg/L as the most common reported numeric pretreatment limit.

## How can CMOM help control FSE FOG discharges?

EPA expects that blockages from FOG discharges will decrease as POTWs incorporate FOG reduction activities into their Capacity, Management, Operations, and Maintenance (CMOM) program and daily practices. CMOM programs are comprehensive, dynamic, utility specific programs for better managing, operating and maintaining sanitary sewer collection systems, investigating capacity constrained areas of the collection system, and responding to SSOs.

Collection system owners or operators who adopt FOG reduction activities as part of their CMOM program activities are likely to reduce the occurrence of sewer overflows and improve their operations and customer service.

## Where can I get more information?

For more information on developing local limits is in the Local Limits Development Guidance, EPA-833-R-04-002A, July 2004, and EPA's Pretreatment Web site, http://cfpub.epa.gov/npdes/home.cfm?program_id=3.

CMOM information is located in the following document, Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems, EPA-305-B-05-002, January 2005, http://cfpub.epa.gov/npdes/sso/featuredinfo.cfm.

Additional information is also available from your state or EPA Regional Office.

## Summary of Major Industry Technical References for Sanitary Sewers - April 2001

| Measure | Technical References |
|---|---|
| Identify and track discharges | Sewer System Infrastructure Analysis and Rehabilitation Handbook, EPA, 1991 |
| Overflow emergency response plans | Preparing Sewer Overflow Response Plans: A Guidebook for Local Governments; American Public Works Assoc, Tele: 816-472-6100 |
| Public notification | Combined Sewer Overflows - Guidance for Nine Minimum Controls, EPA, May 1995. EPA 832-B-95-003 |
| General management, operation and maintenance | Wastewater Collection Systems Management, Manual of Practice No 7, Water Environment Federation, 5th edition, 1999.<br><br>Operation and Maintenance of Wastewater Collection Systems, a field study training program, 4th edition, California State University. Sacramento, 1993.<br><br>Control of Infiltration and Inflow in Private Building Sewer Connections - Monograph. Water Environment Federation, 1999.<br><br>Manual of Practices- Wastewater Collection Systems, NASSCO, 1995<br><br>Detection, Control and Correction of Hydrogen Sulfide Corrosion in Existing Wastewater Systems, EPA-832-R-92-001, Sept, 1992 |
| Capacity evaluations, actions to ensure adequate capacity and rehabilitation | Sewer System Infrastructure Analysis and Rehabilitation Handbook, EPA, 1991<br><br>Existing Sewer Evaluation & Rehabilitation, WEF manual of practice FD-6, ASCE Manual and report on engineering practice no. 62, 1994<br><br>Sewerage Rehabilitation Manual, 3rd ed., Water Research Centre, 1994.<br><br>Inspector Handbook for Sewer Collection System Maintenance and Rehabilitation, NASSCO, 1993<br><br>Manhole Inspection and Rehabilitation, ASCE Manuals and Report on Engineering Practice No. 92, 1997<br><br>Specification Guidelines for Wastewater Collection Systems Maintenance and Rehabilitation, 9th ed., NASSCO, 1996<br><br>Monograph: Control of Infiltration/Inflow (I/I) In Private Sewer Service Connections, WEF, 1999<br><br>Demonstration of Service Lateral Testing and Rehabilitation Techniques, EPA, 1985<br><br>Handbook for Sewer System Evaluation and Rehabilitation, EPA, 1975, EPA/430/9-75/021 |
| Sewer use ordinance - Testing of new sewers | Demonstration of Service Lateral Testing and Rehabilitation Techniques., EPA, 1985<br><br>Gravity Sanitary Sewer Design and Construction, ASCE manual and report on engineering practice no. 60 and WPCF Manual of Practice No. FD-5, 1982. |

| | |
|---|---|
| Performance indicators | Collection Systems: Methods for Evaluating and Improving Performance, California State University, Sacramento, 1998.<br><br>Optimization of Collection System Maintenance Frequencies and System Performance, ASCE, 1999.<br><br>Benchmarking Wastewater Operations-Collection, Treatment, and Biosolids Management, WERF, Project 96-CTS-5, 1997<br><br>Benchmark '95: Wastewater Collection Agencies: An Analysis of Survey Data Charlotte-Mecklenberg Utility Department, 1995<br><br>Stalnaker, R. and M. Rigsy, "Evaluating the Effectiveness of Wastewater Collection System Maintenance." Water Engineering Management, January 1997 |
| General design issues | Construction Grants 1985, EPA, 1984, EPA/430/9-84/004<br><br>Recommended Standards for Wastewater Facilities. 1990, A report of the wastewater committee of the Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers.<br><br>Technical Report 16 - Guides for the Design of Wastewater Treatment Works, 1998, New England Interstate Water Pollution Control Commission.<br><br>Pumping Station Design, 2nd ed, Sanks, 1998<br><br>Design of Wastewater and Stormwater Pumping Stations - MOP FD-4. WEF, 1993.<br><br>Wastewater Engineering: Collection and Pumping of Wastewater. Metcalf & Eddy, Inc., McGraw-Hill, 1981.<br><br>Design and Construction of Sanitary & Storm Sewers - MOP 9. Water Pollution Control Federation , 1969.<br><br>Design Manual for Odor and Corrosion Control in Sanitary Sewerage Systems and Treatment Plants, EPA/625/1-85/018, October 1985 |

To locate these documents, please contact the following:

Office of Water Resource Center (202) 260-7786

National Small Flows Clearinghouse (800) 624-8301

Water Environment Federation www.wef.org
(Formerly: Water Pollution Control Federation)

CA State University, Sacremento (916) 278-6142

American Society of Civil Engineers http://www.asce.org/

# SANITARY SEWER
# COMPLIANCE INSPECTION

## FINAL REPORT

## BILLINGS, MONTANA
## PUBLIC WORKS DEPARTMENT

Office of Compliance and Enforcement
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

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# EXECUTIVE SUMMARY

**Sanitary Sewer**
**Compliance Inspection**
**Billings, Montana**
**Public Works Department**

On July 28 through July 30, 2008, the U.S. Environmental Protection Agency (EPA) Region 8, EPA Headquarters, the State of Montana, and PG Environmental, LLC, subcontractor to Eastern Research Group, inspected the City of Billings (City) Public Works Department's sewer collection and conveyance system and wastewater treatment plant in Billings, Montana. The EPA inspection team evaluated compliance with the City's National Pollutant Discharge Elimination System (NPDES) Wastewater Discharge Permit (MT-0022586). A copy of the permit is provided in Appendix A.

The inspection team identified several inconsistencies between the City's permit and the actual operation and maintenance of the collection system and treatment plant. Table 1 summarizes the permit conditions and the findings identified during the inspection in relation to the City's permit, MT-0022586.

**Table 1. NPDES Waste Discharge Permit MT-0022586 (Billings Sewage Treatment Plant) Compliance Inspection Summary for Billings, Montana**

| Permit Requirement | Compliance Status |
|---|---|
| **I. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS & OTHER CONDITIONS, E. Pretreatment Requirements, 1(f)** The Permittee shall control, through the legal authority in the approved pretreatment program, the contribution to the POTW by each industrial user to ensure compliance with applicable Pretreatment Standards and requirements. | The NPDES permit requires that the Permittee properly control industrial user contributions to the publicly owned treatment works (POTW). An industrial user is defined as a nondomestic source. The City municipal code, Section 26-606, prohibits the discharge of fats, oils, or grease in concentrations greater than 100 parts per million (ppm). Based on the following observations, the City's pretreatment program is not actively or consistently regulating nondomestic sources of oil and grease which is impacting the operation of the collection system, lift stations, and the wastewater treatment plant.<br>1. The inspection team observed excessive oil and grease in the Descro Central lift station.<br>2. The Rimrock Mall grease interceptor immediately upstream of the Descro Central lift station was not being properly maintained. The City's records documented that the Rimrock Mall interceptor was last serviced June 8, 2007.<br>3. Grease removed from the Rimrock Mall grease interceptor was discharged six times between November 22, 2006, and June 8, 2007, to the Billings Sewage Treatment Plant (STP) under the City's "Liquid Waste/Septage Permit – Manifest." None of the six discharges were sampled to confirm compliance with the City's 100-ppm local limit for fats, oils, and grease. |
| **II. MONITORING, RECORDING AND REQUIREMENTS, B. Monitoring Procedures,** All flow-measuring and flow-recording devices used in obtaining data submitted in self-monitoring reports must indicate values within 10 percent of the actual flow being measured. | The City does not have a properly operating influent flow meter. |

**Table 1. NPDES Waste Discharge Permit MT-0022586 (Billings Sewage Treatment Plant) Compliance Inspection Summary for Billings, Montana**

| Permit Requirement | Compliance Status |
|---|---|
| **II. MONITORING, RECORDING AND REQUIREMENTS, D. Reporting of Monitoring Results,** Effluent monitoring results obtained during the previous month(s) shall be summarized for each month and reported on a Discharge Monitoring Report (DMR) Form. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the "Signatory Requirements" and submitted to the Department at the following addresses:<br><br>(a) Montana Department of Environmental Quality, Water Protection Bureau<br>PO Box 200901<br>Helena, Montana 59620-0901<br>Phone: (406) 444-3080<br>(b) U.S. EPA<br>South Park Avenue<br>Drawer 10096<br>Helena, Montana 59626<br>Phone: (406) 441-1123 | The NPDES permit requires that the Permittee submit reports to both the Montana Department of Environmental Quality Water Protection Bureau and EPA. The City failed to inform EPA of problems being experienced with the influent flow meter. |
| **II. MONITORING, RECORDING AND REQUIREMENTS, I. Twenty-four Hour Notice of Noncompliance Reporting**<br><br>1. The Permittee shall report any serious incident of noncompliance affecting the environment as soon as possible, but no later than 24 hours from the time the Permittee first became aware of the circumstances.<br>2. A written submission shall also be provided within 5 days of the time that the Permittee becomes aware of the circumstances. | 1. The inspection team was informed that the City is not reporting sanitary sewer overflows (SSOs)[1] within 24 hours, nor is the City providing a written submission within 5 days as required by its permit. (See Section III.D of report for a definition of SSO.)<br>2. From January 2003 to June 2008, the City experienced 184 SSOs (including building or private properties backups) that were not reported to the State or EPA,<br>3. The inspection team was informed that the City does not report releases of raw sewage to residential buildings or private properties to the State or EPA. |

[1] Note: An SSO is defined as any spill, release, or diversion of municipal sewage, including: (i) An overflow that results in a discharge to waters of United States; and (ii) An overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral), even if that overflow does not reach waters of the United States.

**Table 1. NPDES Waste Discharge Permit MT-0022586 (Billings Sewage Treatment Plant) Compliance Inspection Summary for Billings, Montana**

| Permit Requirement | Compliance Status |
|---|---|
| **II. MONITORING, RECORDING AND REQUIREMENTS, J. Other Noncompliance Reporting**, Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that the monitoring reports for Part II.D of this permit are submitted. | The inspection team was informed that the City does not have an operational influent flow meter as required by its permit (permit (Part I. C, Monitoring Requirements). |
| **III. COMPLIANCE RESPONSIBILITIES, D. Duty to Mitigate,** The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. | 1. The City's pretreatment program is not actively or consistently regulating nondomestic sources of oil and grease. Those sources are negatively impacting the operation of the collection system and thereby creating blockages, which have led to SSOs in the form of building/private property backups and manhole overflows.<br>2. The City experienced 184 total SSOs (unreported) during January 2003 to June 2008. |
| **III. COMPLIANCE RESPONSIBILITIES, E. Proper Operation and Maintenance,** The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. | 1. The City experienced 184 total SSOs (unreported) during January 2003 to June 2008. This total represents an occurrence of approximately 3 SSOs per month or 33 SSOs per year during the time period.<br>2. The inspection team was informed that the City's STP does not have an operational influent flow meter as required by its permit.<br>3. The inspection team observed a bypass line and control valve in the STP's secondary pump station. The bypass line was not labeled correctly, and the control valve was not labeled or "locked out."<br>4. The inspection team was informed that the City recently implemented a maintenance program for its lift stations. Many of the lift station pumps have had significant impeller damage and have not been pumping at design capacity. Detailed maintenance records were not available at the time of the inspection. |

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## LIST OF APPENDICES

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# I. INTRODUCTION

During the week of July 28, 2008, EPA Region 8, EPA Headquarters, the State of Montana, and PG Environmental, LLC, subcontractor to Eastern Research Group, inspected the Billings Public Works Division's wastewater collection system and treatment plant in Billings, Montana. The City provides wastewater conveyance and treatment for flows from the City and the Briarwood Country Club. The City also has agreements with a new development, Rehberg Ranch, and the Lockwood Sewer District to provide wastewater conveyance and treatment when they connect to the City's collection system. The entire sewer collection and conveyance system is separate from the communities' storm water systems.

The purpose of the inspection was to assess the City's operational management and controls of its wastewater collection, conveyance, and treatment system. This report summarizes the results of the inspection. The following personnel were involved in the inspection of the City's sewer collection and conveyance system and wastewater treatment plant:

| | |
|---|---|
| City of Billings Representatives: | Mr. Alan Towlerton<br>Mr. Vern Heisler<br>Mr. Scott Emerick<br>Mr. Doug Lazz<br>Mr. Randy Straus<br>Ms. Susan Stanley<br>Mr. Boris Krizek |
| EPA Region 8: | Ms. Amy Clark |
| EPA Headquarters: | Mr. Loren Denton |
| Montana Department of Environmental Quality: | Mr. Matt McDermott |
| EPA Contractor: | Mr. Danny O'Connell, PG Environmental, LLC |

The compliance inspection consisted of the following major activities:

- Discussions with representatives from the City regarding operation of the sewer collection and conveyance system and the wastewater treatment plant;
- A physical inspection of four sewage lift stations in the sewer system;
- A physical inspection of the wastewater treatment plant;
- A physical inspection of the collection field team's maintenance activities;
- A physical inspection of nondomestic users' oil and grease interceptors;
- Examination of the City's sewer collection and conveyance system and wastewater treatment plant operating procedures and maintenance records; and
- Verification of the City's adherence to the requirements outlined in the permit (MT-0022586).

Section II of this report presents background information on the City's sewer collection and conveyance system and wastewater treatment plant. Section III presents the inspection team's findings with respect to the permit requirements.

## II. COLLECTION AND TREATMENT SYSTEM DESCRIPTION

*Collection System*

The City's wastewater system serves approximately 102,000 residents within a 40-square-mile service area. A daily average of 18.9 million gallons of wastewater from homes, commercial businesses, and industries is transported to the City's wastewater treatment plant through 10 lift stations and more than 433 miles of sewer lines. These sewers, which are 8 to 12 inches in diameter, connect to large trunk lines, which then connect to interceptors. Interceptors are major gravity-flow lines that carry wastewater to the wastewater treatment plant.

The City staff reported four locations at which the sewer collection and conveyance system has been designed to allow for the diversion of wastewater from one trunk or interceptor to another trunk or interceptor that is experiencing lower demand. Three diversion structures positioned to relieve flow demands on local trunk lines were inspected as a component of this inspection. These locations can divert extreme high flows to secondary routes to the wastewater treatment plant. The three locations are Poly Drive and Rehberg, Monad Road and South 18$^{th}$ Street West, and Morey Street at Simpson (Photos 1–3). The fourth diversion structure has been positioned to relieve flow demands on the two interceptors flowing in from the southwest of the plant. This diversion structure is within the Continental Oil Refinery, and it was not inspected as a component of this inspection.

The flow of wastewater through the sewer collection and conveyance system is monitored by a Supervisory Control and Data Acquisition (SCADA) system. The control center for the SCADA system is at the City's water plant. It is manned 24 hours a day and is the primary location for managing field service responses.

The City budgets $4 million each year for capital improvement projects for the sanitary sewer system. City personnel stated that the project scheduled for summer 2008 had to be delayed until summer 2009 because of the timelines of associated utility projects and the short construction season available to the City because of weather.

*Lift Stations*

The City currently manages eight lift stations and at the time of the inspection was preparing to assume responsibility for an additional two lift stations from the Yellowstone Country Club. Individual detailed descriptions of each lift station were not available at the time of the inspection. The City was in the process of conducting operational evaluations of its lift stations.

*Wastewater Treatment Plant*

The Billings Sewage Treatment Plant (STP) was originally constructed in 1948. The current STP includes a complete-mix activated sludge biological process.

The City operates the STP, which is on the Yellowstone River at 725 Highway 87 East. The service area encompasses approximately 40 square miles with a population of approximately 102,000. In addition to domestic sewage, the STP receives an estimated daily flow of 200 gallons a day from its two categorical industrial users (CIUs) and numerous loads of domestic septage and grease trap waste from private haulers. The CIUs discharge directly into the sewer collection and conveyance system, while the haulers discharge at specific locations in the STP. Domestic septage is discharged to the STP's "Waste Disposal Station," and grease trap wastes are discharged at the "Grease Removal Station."

The STP has a design average flow of 26 million gallons per day (MGD). The treatment process includes screening, de-gritting, primary sedimentation in clarifiers, aerobic biological treatment, secondary clarification, and disinfection with chlorine. The removed solids are anaerobically digested and dewatered by centrifuges. The STP discharges to the Yellowstone River via an outfall pipe on the bank of the river.

Based on the City's standard operating procedure document, "Wet Weather High Flow Diversion," (Appendix C), excess flow is diverted after primary treatment to the fourth aeration basin and/or the fourth clarifier for extra storage. Once the high-flow event has ceased, the wastewater is pumped from the storage vessels to undergo secondary treatment prior to discharge.

Secondary conversations held with City staff further explained the wet weather plant operations. When the STP receives flows greater than 26 MGD, the wastewater undergoes screening and de-gritting before the excess flow is diverted to an empty, not-in-service aeration basin (1 million gallon capacity) and/or primary clarifier (0.75 million gallon capacity). Subsequently, either of the following scenarios occurs:

1. If the basins (aeration or primary clarifier) do not fill up and the rain event is not sustained, the water in the basins is drained to an aeration basin that is in service to undergo secondary treatment); or
2. If the rain event is sustained and the basins (aeration and primary clarifier) start reaching capacity, the plant operators turn the basins into treatment units by activating the pumps, sweeps, and so forth in the basins. Therefore, this is another treatment train, which can be used to ensure that all flows undergo secondary treatment.

The plant is rated for a peak hourly flow of 35 MGD. The City stated that each of the four aeration basins can treat up to 10 MGD, for a total aeration basin treatment capacity of 40 MGD.

The City has the capability to implement a bypass of the secondary treatment process via a bypass line and control valve in the secondary pumping station. The bypass line and control valve were observed during the inspection. Under a bypass scenario, a portion of the wastewater would undergo primary treatment only and then be combined (blended) with the secondary treatment flows prior to disinfection and discharge. The City stated that under a historical discharge permit, it was permitted to blend primary and secondary treated effluent, but it has not used that practice in the eight or more years since the new discharge permit was issued.

*Operation and Maintenance*

Operation and maintenance (O&M) records for some components of the STP were available for review during the inspection. The City uses a computerized maintenance management system to automatically track work order requirements and work performed at the STP. The City does not use a computerized maintenance management system to automatically track work order requirements and work performed at lift stations. Consequently, O&M records for lift stations were not available. The City provided a copy of its "Systems Division Work Plan" (Appendix D), which states the City's goals with respect to operation of the sewer collection and conveyance system and the industrial pretreatment program. The work plan states that one of the key objectives of most of the goals is to "maintain proper and adequate records of all maintenance and/or inspection work performed."

It should be noted that the City experienced 184 sanitary sewer overflows (SSOs) during January 2003 to June 2008. See Sections II.D and III.E for further discussion.

Lift Station O&M

The City staff continuously monitors operations at each lift station 24 hours a day through SCADA systems, thereby providing quick response to power outages and equipment failures. Crews check each station once a week to ensure that the equipment is functioning normally. The only documentation available for the lift station O&M is contained in the lift station round sheets. Copies of the July 2006 lift station rounds sheets are contained in Appendix E. The City had limited O&M manuals for the existing lift stations and did not have any documentation regarding regular lubrication or preventive maintenance for equipment.

The inspection team was informed that the pumps at the 5-Mile and Lake Hills lift stations were recently rehabilitated. The rehabilitation process included overhauling the station pumps. The impellers to the pumps were found to be significantly damaged; Photo 4 documents the extent of the damage. The extent of the impact on the pump's pumping capacity and the period during which the pumps operated at this impaired state are unknown.

Collection Sewer Cleaning and Repair Program

The City's "Systems Division Work Plan" (Appendix D) provides objectives for the cleaning of sewer lines. Table 2 summarizes the work plan's objectives for cleaning sewer lines.

**Table 2. Systems Division Work Plan Objectives**

| Description of Task | Frequency |
|---|---|
| Jet-clean all clay lines 12 in. or less in diameter | Annually |
| Jet-clean all PVC lines 12 in. or less in diameter | Biannually |
| Inspect all manholes and appurtenances | Annually |
| Perform spot repairs on all lines | Within 45 days of documenting deficiency |
| Chemically treat all lines having significant tree root intrusion | Biannually |
| Sewer line replacement program | Annually |

The City reported that crews had cleaned the entire system in the previous year. The inspection team observed some of the City sewer cleaning operations on July 29. The cleaning crew (jetting team) had cleaned 14 lengths of sewer as part of its regular operations and had responded to one blockage situation. Photo 5 is a copy of the cleaning crew's field sheet.

In addition to the annual cleaning, 21 hot spots that receive monthly jet-cleaning have been identified (Appendix F). The collections team has an operational budget of $1,029,102 ($720,372 for cleaning, $102,910 for general maintenance, $102,910 for repairs, and $102,910 for closed-circuit television operations).

The City provided the inspection team with a summary of the sewer replacement projects for the period FY 2006–2007 through FY 2011–2012 (Appendix G). This summary documents how the City allocates its annual budgets for sewer rehabilitation and replacement. The City's sewer rehabilitation projects scheduled for 2008 have been rescheduled for 2009 (Appendix H). The inspection team was informed that projects were rescheduled so that other City projects associated with street work in these areas could be coordinated to maximize City resources (e.g., resurfacing a street only once) and minimize inconvenience to residents (e.g., taking a street out of service multiple times for underground asset rehabilitation).

Sewer Inspection Program

In 2007 City staff inspected approximately 32 percent of the sewer collection and conveyance system using closed-circuit television. The City also conducted 8,733 manhole inspections as a component of the inspection program. The 34 manholes that have been identified as problem areas are visually inspected monthly (Appendix I).

Industrial Pretreatment Program

The City has implemented an industrial pretreatment program (IPP), which regulates all the categorical and significant industrial dischargers to the City's sewer collection and conveyance system. The City has adopted rules and regulations that regulate the discharge of nondomestic wastewaters to the sanitary sewer (Billings' Municipal Code, Article 26-600; see Appendix J).

The IPP also permits the discharge of "liquid waste/septage" to the STP by means of a manifest-type permit. Domestic septage is discharged to the STP's "Waste Disposal Station," and grease trap wastes are discharged at the "Grease Removal Station." The IPP "Liquid Waste/Septage Permit - Manifest" (Appendix K) requires detailed information so that the waste is properly documented, as well as certified statements from the generator and the hauler to ensure that wastes meet the requirements of Billings' Municipal Code, Section 26-606. In an effort to ensure that all parties are completely aware of the prohibitions under Municipal Code Section 26-606, the prohibitions are listed on the back of the "Liquid Waste/Septage Permit – Manifest."

## III. ASSESSMENT OF COMPLIANCE WITH PERMIT REQUIREMENTS

The EPA inspection team evaluated the City's compliance with Billings' NPDES permit (MT-0022586). The permit has an effective date of November 1, 2006, and an expiration date of October 31, 2011. The EPA inspection team identified several inconsistencies regarding the City's compliance with this permit, which are reported as findings below, by permit requirement.

### A. Requirement Part I, E. Pretreatment Requirements, 1(f)

The NPDES permit requires that the Permittee properly control industrial user contributions to the publicly owned treatment works (POTW). The City's municipal code (Article 26-600, Industrial Waste Discharge) defines an *industrial user* as "any person or source that introduces or discharges wastewater from industrial processes into the wastewater system, or any nondomestic user or source regulated under Section 307(b), (c), or (d) of the Clean Water Act." In addition, the municipal code, Section 26-606, prohibits the discharge of fats, oils, or grease in concentrations greater than 100 ppm.

The inspection team observed excessive oil and grease in the Descro Central lift station. A major contributor to that lift station is the Rimrock Mall, directly across the street from the lift station. The mall's grease interceptor immediately upstream of the Descro Central lift station was not being properly maintained. The City's records document that the Rimrock Mall grease interceptor was last serviced June 8, 2007. Based on these observations, the City's pretreatment program is not actively or consistently regulating nondomestic sources of oil and grease, which is adversely affecting the operation of the collection system and the lift stations.

In addition to documenting that the mall's grease interceptor had not been cleaned since June 2007, the records for the Rimrock Mall document that 13,000 gallons of grease and liquid grease were removed from the mall's grease interceptor in November 2006 (Table 3).

**Table 3. Summary of Grease Removal from Rimrock Mall**

| Date | Description of Waste | Volume (gallons) |
|---|---|---|
| November 22, 2006 | Grease | 3,000 |
| November 24, 2006 | Grease | 3,000 |
| November 27, 2006 | Grease | 3,000 |
| November 27, 2006 | Liquid grease | 3,000 |
| November 27, 2006 | Liquid grease | 1,000 |
| June 8, 2007 | Grease trap | 2,000 |

Based on a review of the available grease interceptor cleaning records and the visual inspection conducted July 29, 2008, the Rimrock Mall grease interceptor is not being properly maintained. Visual inspection of the Descro Central lift station wet well and the sanitary sewer manhole immediately downstream documented excessive grease. Photos 4–7 document the visual conditions found during the inspection.

Appendix K contains a blank copy of the City's "Liquid Waste/Septage Permit – Manifest." The reverse side of the document contains a list of prohibited materials and the maximum allowable pollutant concentration for fats, oil, and grease. Both the City municipal code and the "Liquid Waste/Septage Permit – Manifest" require that discharges of fats, oil, and grease not exceed 100 ppm. The inspection team documented six occasions on which the City failed to sample the grease and liquid grease hauled to the sewage treatment plant for disposal for compliance. A review of the "Liquid Waste/Septage Permit – Manifests" also found that only three of the discharges had been witnessed by plant personnel, based on the completion of the paper work (Appendix L).

## B. Requirement Part II, B. Monitoring Procedures

The NPDES Permit requires that all flow-measuring and flow-recording devices used in obtaining data submitted in discharge monitoring reports (DMRs) must indicate values within 10 percent of the actual flow being measured.

A letter dated December 20, 2006, was sent to the Montana Department of Environmental Quality reviewing the status of the STP's malfunctioning influent flow meter (Appendix M). The letter states that the influent flow meter is "very erratic, jumping several million gallons a day and then a couple of days later, dropping down."

The DMR for May 2008 (Appendix N) states that the influent flow meter was off-line May 22–29, 2008, implying that the influent flow meter was operating properly at all other times.

The inspection team was informed that the influent flow meter was not operating properly at the time of the STP site review. The current status of the influent flow meter and its accuracy were unclear.

## C. Requirement Part II, D. Reporting of Monitoring Results

Effluent monitoring results obtained during the previous month(s) must be summarized for each month and reported on a DMR form. Legible copies of these, and all other reports required, must be signed and certified in accordance with the "Signatory Requirements" and submitted to the Department at the following addresses:

(a) Montana Department of Environmental Quality, Water Protection Bureau
PO Box 200901
Helena, MT 59620-0901
Phone: (406) 444-3080

(b) U.S. EPA
South Park Avenue
Drawer 10096
Helena, MT 59626
Phone: (406) 441-1123

The NPDES permit requires that the Permittee submit reports to both the Montana Department of Environmental Quality Water Protection Bureau and the U.S. EPA.

The City failed to inform EPA of the influent flow meter problems being experience in 2006. A letter dated December 20, 2006, was sent to the Montana Department of Environmental Quality reviewing the status of the malfunctioning influent flow meter; however, the letter was not forwarded to EPA.

**D. Requirement Part II, I. Twenty-four Hour Notice of Noncompliance Reporting**

The Permittee must report any serious incident of noncompliance affecting the environment as soon as possible, but no later than 24 hours from the time the Permittee first became aware of the circumstances. A written submission must also be provided within 5 days of the time that the Permittee became aware of the circumstances.

The inspection team was informed that the City is not reporting SSOs within 24 hours, nor is the City providing a written submission within 5 days as required by its permit. An *SSO* is defined as any spill, release, or diversion of municipal sewage, including:

(i) An overflow that results in a discharge to waters of United States; and

(ii) An overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral), even if that overflow does not reach waters of the United States.

During January 2003 to June 2008, the City experienced 184 SSOs that were not reported to the State or EPA (Table 4).

**Table 4. Summary of Unreported SSOs, January 2003–June 2008**

| Year | Number of SSOs |
|---|---|
| 2003 | 34 |
| 2004 | 40 |
| 2005 | 35 |
| 2006 | 31 |
| 2007 | 26 |
| 2008 (1/08–6/08) | 18 |
| **TOTAL** | **184** |

A review of the City's "Sanitary Sewer Maintenance Complaint Reports" identified a number of SSOs that were not reported to the State and/or EPA (Table 4). Appendix O contains example copies of the "Sanitary Sewer Maintenance Complaint Reports" documenting SSOs. For the period of January 2003 through June 2008, there were nine documented SSOs into City resident's buildings/private properties. The inspection team was informed that the City does not report releases of raw sewage to residential buildings/private property.

The City experienced a total of 184 SSOs (unreported) during January 2003 to June 2008. The nine documented SSOs are included in the 184 unreported SSOs during January 2003 to June 2008.

The City has no formal written standard operating procedures (SOPs) for standardizing field observations made by field crews concerning volumes of untreated wastewater released from the sanitary sewer collection system to the street and/or residential buildings/private property. The City's "Sewer Complaint Worksheet" (Appendix P) does document the depth of wastewater in residential buildings/private property, but it does not collect the information needed to calculate the volume of wastewater released from the collection system. The worksheet does not require the field crew to document any of the field variables associated with the release of untreated wastewater from manholes (e.g., approximate time SSO started, volume of wastewater released, impact of discharge, method of cleanup and disinfection).

The inspection process also incorporated a review the City's reporting practices implemented in response to the Five Mile Creek Lift Station force main leak in 2000 and the Five Mile Creek Lift Station SSO in 2005. In both situations only limited documentation existed with respect to reports made to regulatory agencies. There was no documentation to confirm that the Montana Department of Environmental Quality and/or EPA had been notified of the leak or the SSO. Appendix Q contains copies of the limited information available at the time of the inspection.

## E. Requirement Part II, J. Other Noncompliance Reporting

The NPDES permit requires that the Permittee report any noncompliance not required to be reported within 24 hours as a component of the monthly DMRs.

The inspection team was informed that the City does not have an operational influent flow meter as required by its permit (Part I, C. Monitoring Requirements). The influent flow meter has not been operational since prior to December 2006. In a letter dated December 20, 2006, the City informed the Montana Department of Environmental Quality that the influent meter was not operating properly. The permit requires that all flow-measuring and flow-recording devices used in obtaining data submitted in

self-monitoring reports must indicate values within 10 percent of the actual flow being measured; the nonfunctioning influent meter was not reported in any self-monitoring reports.

**F. Requirement Part III, D. Duty to Mitigate**

The NPDES permit requires that the Permittee take all reasonable steps to minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health.

The City's pretreatment program is not actively or consistently regulating nondomestic sources of oil and grease. These sources are adversely affecting the operation of the collection system and thereby creating flow restrictions and blockages, which can lead to SSOs in the form of building/private property backups and manhole overflows.

The City experienced 184 total SSOs (unreported) during January 2003 to June 2008.

**G. Requirement Part III, E. Proper Operation and Maintenance**

The NPDES permit requires that the Permittee must at all times properly operate and maintain all facilities and systems of treatment and control installed or used by the Permittee to achieve compliance.

A failure to operate and maintain the collection system properly has resulted in 184 total SSOs (unreported) during January 2003 to June 2008. This total represents an occurrence of approximately 3 SSOs per month or 33 SSOs per year during the time period. See Section III.D for a discussion and summary of SSO occurrences.

The inspection team was informed that the City's STP does not have an operational influent flow meter as required by its permit.

The inspection team observed a bypass line and control valve in the STP's secondary pump station. The bypass line was not labeled correctly, and the control valve was not labeled or "locked out." After the completion of the inspection, the City stated that the City has placed a lock on the control valve so that it cannot be used by accident. The City, however, still maintains the ability to bypass the secondary treatment processes.

The inspection team was informed that the City recently implemented a maintenance program for its lift stations. Many of the lift station pumps have had significant impeller damage (Photo 4) and have not been pumping at design capacity. Whether any maintenance was being performed on the lift station equipment prior to January 2008 is unclear; no records were available at the time of the inspection. The City does not employ a computer maintenance management system for its lift station assets, and detailed maintenance records were not available at the time of the inspection.