

US EPA ARCHIVE DOCUMENT

SEWAGE COLLECTION SYSTEM INSPECTION FORM
City of Berkeley, CA

GENERAL INFORMATION**Inspection Dates: April 7 and 8, 2009**

Utility Name: City of Berkeley
Address: Engineering: 1947 Center Street, 4th Floor, Berkeley, CA 94704 Public Works Corp Yard: 1326 Allston Way, Berkeley, CA 94702
Contact Persons: Engineering: Jeff Egeberg, (510) 981-6400 Kenneth Emeziem, (510) 981-6444 Adadu Yemane, (510) 0981-6413 Operations: Andrew Clough, (510) 981-6661 Kem Loong, (510) 981-6479

Inspectors Names	Agency/Contractor
Michelle Moustakas	EPA Region 9
Anna Yen	EPA Region 9
Bill Hahn	SAIC
Dianne Stewart	SAIC

Utility personnel who accompanied inspectors

Name	Title
Andrew Clough	Deputy Public Works Director
Jeffrey Egeberg	Manager of Engineering
Kenneth Emeziem	Supervising Civil Engineer
Adadu Yemane	Associate Civil Engineer
Kem Loong	Public Works Maintenance Superintendent
Jesus Sandoval	Public Works Supervisor
Kirk Ross	Public Works Supervisor
Joy Brown	Environmental Compliance Specialist

SYSTEM OVERVIEWPopulation: 105,000Service Area (Sq. Miles): 10.5

Service Area Description:

	Residential	Commercial	Industrial	Total
Number of service connections	29,362	1,918	100	31,380

Combined Sewers (% of system): 0

Name and NPDES permit number for WWTP(s) owned or operated by the collection system utility: NA

Name and NPDES permit number for WWTP(s) that receive flow from the collection system utility: East Bay Municipal Utility District (EBMUD). Order No. 01-072, NPDES Permit No. CA0037702

Names of upstream collection systems sending flow to the collection system utility: City of Albany, City of Kensington, City of Oakland, and University of California

Names of downstream collection systems receiving flow from the collection system utility: EBMUD

Do any interagency agreements exist with upstream collection systems? No

Does the utility maintain the legal authority to limit flow from upstream satellite collection systems? No

SYSTEM INVENTORY (*list only assets owned by utility*)

Miles of gravity main	Miles of force main	Miles of Laterals	Number of maintenance access structures	Number of pump stations	Number of siphons
258	0.9	130	7,200	7	0

Utility responsibility for laterals (none, whole, lower) Lower

Size Distribution of Collection System: (Info from GIS that still needs confirmation)

Diameter in Inches	Gravity Sewer (Miles)	Lower Laterals (Miles)	Force Mains (Miles)
6 Inches or Less	68	130	0.5
8 Inches	132	0	0.3
9 - 18 Inches	46	0	0.1
19 - 36 Inches	9	0	0
> 36 Inches	3	0	0
Totals	258	130	0.9

Age Distribution of Collection System (Public Mains and Pump Stations)

Age	Sewer Mains*, Miles	# of Pump Stations
0 – 25 Years	167	2 (2003)
26 – 50 Years	30	5 (1978)
51 – 75 Years	22	0
> 76 Years	39	0
Totals	258	7

* The City’s GIS does not have installation year data for approximately 50 miles of gravity sewers. This data is the City’s best estimate of the sewer ages.

Comments

Berkeley owns the pipe that conveys wastewater from Albany. This pipe is located within Albany.

Most of the six-inch pipe is located in the hills. When six-inch pipe is replaced, it is replaced with eight-inch pipe.

Two of the pump stations are located in Aquatic Park, and five are located in the Marina area.

The inspection team visited pump station numbers 7 (Photos 1 and 2), 5 (Photos 3 and 4) and 3 (Photos 5 and 6). Stations 3 and 5 are at the Berkeley Marina, and station 7 is in Aquatic Park. Information about these stations is found in the last section of this checklist. City staff stated that they are planning to rehabilitate stations 1, 2, 3 and 4.

SYSTEM FLOW CHARACTERISTICS

Collection System (data provided by EBMUD)		
Average Daily Dry Weather Flow (MGD)	Peak Daily Wet Weather Flow (MGD)	Peak Instantaneous Wet Weather Flow (MGD)
12.5		116

Wastewater Treatment Plant		
Average Daily Dry Weather Flow (MGD)	Peak Daily Wet Weather Flow (MGD)	Peak Instantaneous Wet Weather Flow (MGD)
NA		

Upstream Satellite Name	Avg. Dry Weather Flow*		Peak Flow* (MGD)	Flow Based on Meter or Estimate?
	(MGD)	% of Total Flow		
City of Albany				
City of Kensington				
City of Oakland				
University of California, Berkeley				
* Flow data for the satellite sewer systems is being developed as part of the capacity evaluation that is in progress.				

Constructed Relief Points		
Relief Point	Location	Number of Discharges/Year
	None known	

Comments

Flow from the University of California, Berkeley (UC) enters the City’s pipes at two or three points. The City does not regulate UC flows, and does not know how much flow is contributed from this source. There have been no collection system problems related to flows from UC. The City does not charge UC user fees.

REGULATORY BACKGROUND

Does the system operate under the provisions of an NPDES permit (either their own or under provisions of another agencies permit)? Yes

Permit holder City of Berkeley NPDES Permit No. CA0038466

List provision of the permit that apply (If permit holder is other than the agency being inspected)

Does the system operate under a state permit? Yes – Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, State Water Resources Control Board (SWRCB) Order No. 2006-0003-DWQ, May 2, 2006 as amended by SWRCB Order No. 2008-0002-EXEC, February 20, 2008

Are there any spill reporting requirements? Yes

Which agency (or agencies) promulgates the spill reporting requirements? RWQCB and SWRCB

Outline the spill reporting requirements (summarize spill reporting requirement for each applicable statute, regulation and permit):

The City uses the California Integrated Water Quality System (CIWQS) electronic reporting system for reporting SSO information to the SWRCB.

Category 1 SSOs that reach Waters of the State

If a Category I SSO results in a discharge to Waters of the State (a drainage channel or a surface water, if not fully recovered), the following reporting requirements apply:

- Within two hours of notification of the spill event the City must notify:
 - Notify OES,
 - Notify the City Environmental Health Division, and
 - Prepare an initial electronic report using RWQCB Electronic Reporting System.
- Within 24 hours of notification the City must certify to the RWQCB that OES and the City Environmental Health Division were notified within two hours. This notification should be made using the RWQCB Electronic Reporting System.
- Within 3 business days of the spill event, the City must certify the initial spill report using CIWQS.
- Within 15 calendar days of the conclusion of SSO response and remediation, the City must certify the final spill report using CIWQS.

Category 2 SSOs

Within 30 calendar days after the end of the calendar month in which the SSO occurs, the City must certify spill reports using CIWQS.

Private Lateral Sewage Discharges

The City may report private lateral SSOs using CIWQS at the City's discretion.

No Spill Certification (Monthly)

If there are no SSOs during the calendar month, the City must submit an electronic report that the City did not have any SSOs. The City must certify the report within 30 calendar days after the end of each calendar month.

CIWQS Not Available

In the event that CIWQS is not available, the City must fax all required information to the RWQCB office in accordance with the time schedules identified above. In such event, the City must submit the appropriate reports using CIWQS as soon as practical.

Comments:

In February 2008, SWRCB issued new SSO notification requirements in Order No. WQ 2008-0002-EXEC. On May 1, 2008, RWQCB 2 sent a letter to permitted dischargers explaining the new reporting requirements. The letter contains the following summary table showing these requirements:

Communication Type (all are required)	Agency Being Contacted	Timeframe Requirements	Method for Contact
1. Notification	Office of Emergency Services	As soon as possible, but not later than 2 hours after becoming aware of the SSO.	Telephone – (800) 852-7550 (obtain a control number from OES)
	Local health department	As soon as possible, but not later than 2 hours after becoming aware of the SSO.	Depends on local health dept.
	Regional Water Board	As soon as possible, but not later than 2 hours after becoming aware of the SSO.	Electronic www.r2esmr.net/sso_login2.asp
2. Certification	Regional Water Board	As soon as possible, but not later than 24 hours after becoming aware of the SSO.	Electronic www.r2esmr.net/sso_login2.asp
3. Reporting State Water Board	State Water Board (CIWQS)	Category 1 SSO: initial report within 3 business days , final report within 15 calendar days after response activities have been completed.	Electronic (only) to CIWQS
		Category 2 SSO: within 30 calendar days after the end of the calendar month in which the SSO occurs.	Electronic (only) to CIWQS

In Berkeley, a Supervisor does the initial notification, and a Senior Supervisor does the spill certification.

The City has a comprehensive Sewer System Management Plan (SSMP) dated March 31, 2009.

SPILLS

Note: Spill Rate = Number of SSOs/100 Miles of Sewer Pipe/Year									
Year	Mains (258 Miles of Mains)			Laterals (130 Miles of Laterals)			Totals (388 Total Miles)		
	# SSO's	Spill Rate	Gross Spill Volume	# SSO's	Spill Rate	Gross Spill Volume	Total SSO's	Total Spill Rate	Total Gross Spill Volume
2005 ^{1,2}	20	7.8		55	42		75	19	
2006 ²	12	4.7		57	42		69	18	1,661
2007 ^{2,3}							51	12	8,368
2008	15	5.8	27,670	53	41	2,251	68	18	29,921
2009 ⁴	8	12	1,781	11	34	94	19	20	1,875
Total	55	NA	29,451	176	NA	2,345	282	NA	41,825

Notes:

1. CY 2005 data includes December 2004 spills.
2. CY 2005, 2006, and 2007 data does not include spill volumes for mains and lower laterals.
3. CY 2007 data does not differentiate between main and lower lateral spills.
4. Data shown through March 31, 2009.

Spill Cause

Year ¹	Blockage								Gravity Pipe Break		Force Main Break		Pump Station		Capacity		
	Grease		Roots		Debris		Other		#	%	#	%	#	%	#	%	
	#	%	#	%	#	%	#	%									
2008	3	23	6	46	1	8	3	23	0	0	0	0	0	0	0	0	0
2009 ²	1	13	5	63	1	13	1	13	0	0	0	0	0	0	0	0	0
Total	4	NA	11	NA	2	NA	4	NA	0	NA	0	NA	0	NA	0	NA	0

Notes:

1. Data prior to CY 2008 does not indicate the primary cause of the spill.
2. Data shown through March 31, 2009.

Spill Cause (Public Lower Laterals)

Year ¹	Blockage								Gravity Pipe Break	
	Grease		Roots		Debris		Other		#	%
	#	%	#	%	#	%	#	%		
2008	3	6	22	42	8	15	17	32	3	6
2009 ²	0	0	4	36	5	45	0	0	1	9
Total	3	NA	26	NA	13	NA	17	NA	4	NA

Notes:

1. Data prior to CY 2008 does not indicate the primary cause of the spill.
2. Data shown through March 31, 2009.

Building Backups (*List Only Backups Caused by Problems in Sewer Mains*)

<i>Year</i>	<i>Number of backups</i>	<i>Cost of Settled Claims</i>
2006	4	\$85,447
2007	4	\$14,444
2008	2	\$37,359
Total	10	\$137,250

Comments

Roots were the greatest cause of spills in 2008 and 2009. Information for prior years is not available.

The City does not report private lateral spills, but will call the Environmental Health Department so that they can notify the homeowner. If a spill from a private lateral enters the public right-of-way the City will report the spill as a private lateral spill in CIWQS.

City staff stated that it has been 10 to 15 years since they had a pump station failure that resulted in a spill. There have been no force main failures. Four pump stations do not have stand-by generators.

The City does not keep a list of spills. A printout of spills from CIWQS was provided.

The inspection team visited the spill site at 2000 Addison St. This 1,000 gallon spill occurred on 7/21/2008 due to a blockage in a 15-inch main. Staff from the Engineering Division saw that there was a wet area around a manhole, but there was no flow at that time. They called dispatch. An overflow was observed soon after. Two vacuators were called in to contain the spill. City crews attempted to use rods to clear the blockage, but the rods broke in the pipe. Some wastewater was diverted back to the sanitary sewer, and some was vactored, but crews were unable to capture 500 gallons, which entered a storm drain. The blockage was finally relieved by a jetter, and was found to consist of roots and gravel. The pipe was vitrified clay, and the roots were suspected to be from liquidambar trees along the sidewalk. The City used the incident as a training opportunity and did a debriefing afterwards.

STAFFING

Indicate Number of Staff

Management and Administrative: 0.8

Maintenance: 22

Electricians and Mechanical Technicians: 0¹

Operators: 0

Engineering (design and construction): 7

Engineering (private lateral program): 2

¹ Lift station electrical components and emergency generators are maintained by Public Works electricians.

Number of Certified Collection System Operators/Certification Program: 0

Number of Sewer Cleaning Crews: 4 Total: 2 Jet Flushing, 1 Hand Rodding, and 1 Back Line

Sewer Cleaning Crew Size: Rodding and Jet Flushing = 2, Hand Rodding = 2, Back Line = 3

Contractor Services	Contractor Name(s) (NA if contractors not used)	Cost (\$/year)
Sewer Cleaning	NA	
Chemical Root Control	NA	
Spot Repairs	NA	
CCTV	E2/Subtronics	\$150,000
Spill Response	NA	
Other:	NA	

Comments

All CCTV work is contracted out. The contract is used for televising prior to project design, screening to determine what projects are needed, for emergencies, and at the request of field staff. There is no routine CCTV.

Staff positions indicated work solely on sewers, and all positions are currently occupied.

EQUIPMENT

List Major Equipment Owned by the Utility:

Equipment	Number	Number in Service
Combination Trucks (Hydroflush and Vactor)	2	2
Mechanical Rodder	1	1
CCTV Truck	1	0 (using contractor)
Utility Truck	1	1
Portable Pumps	1 (6 inch) 3 (4 inch)	1 3
Portable Generator	0	NA

FINANCIAL

Revenues (FY 2009 Budget)

Revenue Source	Annual Revenue (\$/year)
User Fees	\$13,385,419
Connection Fees	\$687,511
Grants	0
SRF Loans	0
Interest	\$633,706
Total	\$14,706,636.00

Expenses (FY 2009 Budget)

Expense	Annual Cost (\$/year)	Cost/Mile of Pipe/Year*
Labor	\$5,124,850	\$13,208.38
Capital Improvements	\$4,359,966	\$11,237.03
Other Sewer-related Expenses	\$2,033,598	\$5,241.23
Indirect Costs	\$641,291	\$1,652.81
Total	\$12,159,705.00	\$31,339.45
* Total Pipe Mileage: 388		

Average Monthly Household User Fee for Sewage Collection: \$23.17
Wastewater Treatment (EBMUD): \$15.50
Total Wastewater Fees: \$38.67

Sewer Fee Rate Basis (i.e. water consumption, flat rate, etc.): water consumption

Last Fee Increase (Date): July 1, 2006

Planned Fee Increases: No plans at this time

Capital Improvement Fund: \$16,549,000 for 4 years (FY2009 – 2012)

Comment

The cost per mile of pipe per year figures include mains and lower laterals.

SPILL RESPONSE, NOTIFICATION AND REPORTING

Does the Utility Have a Written Spill Response Plan? Yes

Is the Plan Carried by Maintenance/Spill Response Crews? Yes

Indicate Elements Included In the Spill Response Plan		
Element	Y/N	Comment
Identification of Responsible Staff	Y	
DISPATCH		
System for Becoming Aware of Spills	Y	
System for Receiving Public Calls	Y	

Indicate Elements Included In the Spill Response Plan		
Dispatch Procedures – Normal Hours	Y	
Dispatch Procedures – After Hours	Y	
Coordination with First Responders (police, fire department)	N	Public Works becomes incident commander upon arrival at spill site.
Response Time Goal	Y	< 1 Hour
SPILL CONTROL/MITIGATION		
Spill Response Activity Sequence	Y	Clear blockage, then contain.
Spill Site Security	Y	
Procedures for Stopping Spills	Y	
Spill Containment	Y	
Protection of Storm Drains	Y	
Cleanup/Mitigation	Y	
DOCUMENTATION		
Spill Volume Estimation (list methods in comment field)	Y	Eyeball estimate, manhole overflow rate and duration, and measurement of contained volume
Determination of Spill Start Time	Y	
Spill Sampling	Y	
Receiving Water Sampling	Y	
Photographing Spill Site	Y	
Field Notes Form	Y	
Spill Report Form	Y	
NOTIFICATION		
Notification of Affected Public (schools, recreational users, etc.)	Y	
Posting Warning Signs	Y	
Sanitation Information re: building backups	Y	
REPORTING		
Reporting Procedures	Y	
Spill Report Forms	Y	
Persons Responsible for Filing Reports	Y	

Are all spills reported regardless of volume? Yes

Are Contractors Required to Follow Spill Response Procedures? Yes

Average Spill Response Time (normal work hours): 0.5 hours (CY 2008)

Average Spill Response Time (after hours/holidays): 0.8 hour (CY 2008)

Does the Utility CCTV Pipes Following Spill? No

Are Cleaning Schedules Adjusted in Response to Spills? Yes

Comments

Within the last year the City began investigating the causes of each SSO, to prevent recurrence. Sometimes this is done using CCTV, but not always.

Citizen complaints are the major method by which the City becomes aware of spills. The number to call is posted on the City's website and is in the phone book. There is an answering service

that receives calls after 5 PM. The City is establishing a 311 Call Center that in the near future will receive Public Works calls.

The City determines spill start time to be at least at the time the call was received. However, spill start time may be found to be earlier than this depending on information from the responding crew.

SEWER CLEANING AND MAINTENANCE

Does the Utility Have Detailed Sewer System Maps? Yes

Are Maps on GIS Database? Yes

Are Maps Available to Maintenance Crews? Yes – paper maps on the truck

Does the Utility Have a Written Maintenance Management System? Yes – see SSMP

Does the Utility Have a Computerized Maintenance Management System? Yes

ANNUAL SEWER CLEANING – Include hydroflushing, mechanical and hand rodding		
Pipe Cleaning excluding repeats		Pipe Cleaning Including Repeats
(miles/year)	% of system/year	(miles/year)
		71.6 (CY 2008)*
*Sewer cleaning production data is from CMMS work orders. City staff believes that additional sewer cleaning was completed but was not recorded in the work orders (due to incomplete data entry).		

System Cleaning Frequency (years to clean entire system): 6 Years (See SSMP)

Hot Spots subject to more frequent cleaning: Approximately 35 Sewer Main Locations = 1.2 Miles of Pipe and 33 Lower Lateral Locations = 0.5 Miles of Pipe (Excluding Repeats)

Types of problems subject to hot spot cleaning? Grease and root problem areas

Hot Spot Cleaning Schedule (Mains Only)

Cleaning Frequency	Estimated Number of Locations	Pipe Length Excluding Repeats (Miles)	Pipe Length Including Repeats (Miles)
1/Month	7	0.23	2.8
6/Year	9	0.33	2.0
4/Year	13	0.43	1.7
2/Year	6	0.20	0.4
1/Year	0	0	0
Totals	35	1.19	6.9

Chemical Root Treatments

Length of pipe subject to chemical root treatments (miles/year): 0

Chemical treatment frequency: NA

Root treatment chemicals used: NA

Spot Repairs

Spot repairs completed annually: 73; _____ (miles/year)

Spot repair budget (\$/year):

Spot repair expenditures last year:

Odors

Annual number of complaints: Infrequent

Odor hot spot locations: One sewer main that runs through Albany

Odor treatment facilities: Periodically apply deodorant

Easement Pipe Cleaning

Total length of easement pipes (miles): Unknown

Annual easement pipe cleaning (miles/year): 8.4 (CY 2008)

Do maintenance workers have access to all easements? Yes

Comments

The GIS contains all known pipes. It is not cross-referenced to the CMMS, so maintenance records and SSOs are not part of the GIS.

For lower laterals that are on the hotspot list, the City will also typically clean a portion of the upper lateral. For instance, if a street tree is causing root blockages in the lower lateral, the City will clean up past this into the upper private lateral. The City will also install a cleanout if there isn't one.

The City tries to develop a permanent solution for any structural issues that are causing hotspots.

Use of root chemicals has to be approved by the Public Health Department. They may decide to use chemical root treatments in the future.

City staff stated that the SSMP has not yet been approved by the City Council.

FATS, OILS AND GREASE (FOG) CONTROL

Does the Utility have a FOG source control ordinance?

- EBMUD has a Wastewater Control Ordinance

Ordinance Citation: East Bay Municipal Utility District Wastewater Control Ordinance, Ordinance 311A-03

Agency responsible for implementing the FOG control program:

- Collection System Agencies and EBMUD for respective program components

Number of Food Service Establishments (FSEs) in service area:

- Approximately 3,000

Number of FSEs subject to FOG ordinance:

- Same as number of FSEs

Indicate Elements Included In the Food Service Establishment FOG Source Control Program		
Element	Y/N	Comment
FSE Permits	Y	
FSE inspections	Y	
FSE enforcement	Y	
Oil & grease discharge concentration limit		EBMUD's Ordinance has an O&G limit; however, the FOG program focuses on GRD installation and appropriate maintenance
Grease removal device (GRD) requirements:		
traps		
interceptors	Y	
Automatic cleaning traps		
FSEs subject to GRD installation:		
all FSEs (new and existing)		
new FSEs	Y	
remodeled FSEs	Y	Remodels > \$75,000
for cause at existing FSEs	Y	
GRD maintenance requirements:		
Cleaning frequency	Y	Every 3 months or more as needed
25% rule (grease and solids accumulation)	Y	EBMUD requires increased pumping frequency if >25% grease/solids
Kitchen BMP Requirements (list required BMPs below)		
		BMPs are recommended, not required (BMP information attached)
Allowance for chemical additives?		See BMPs ("Do not use emulsifiers or solvents...")
Allowance for biological additives?		Not recommended
FOG Disposal Requirements		See permit for maintenance and disposal requirements
FOG Disposal Manifest System		See permit for documentation/manifest requirements

Number of FOG Program staff:

Inspectors 10

Permit writers 1

Other 4

FSE Inspection frequency: Every 5 years for routine inspections, as needed for Hotspot Response

Annual number of FSE inspections: _____

Does Utility use CCTV to identify FOG sources? Yes

Does sewer maintenance staff coordinate with FOG source control program staff? Yes.

Collection system agencies report hotspots to EBMUD Staff

Cleaning targeted to FOG hot spots? _____
 Maintenance crew referrals to FOG program? _____
 Pipe repairs at FOG hot spots? _____

Describe program for public outreach and education related to residential FOG sources:

- EBMUD conducts outreach to businesses (FSEs), universities and residents, both throughout the year and during the holidays. EBMUD has expanded its multi-lingual targeted outreach in residential areas that have SSOs and blockages.
 - EBMUD includes outreach with permit issuances and inspections via BMPs, posters, and brochures, most in multiple languages (English, Chinese, Spanish, Korean, and Vietnamese).
 - EBMUD has coordinated with UC Berkeley for targeted outreach to the university's residential areas
 - EBMUD has general residential outreach including *Customer Pipeline* articles, articles in other newsletters, and information on the EBMUD website. EBMUD also targets residential outreach to hotspot areas in coordination with the collection system communities, via distribution of doorhangers with information in English, Chinese, and Spanish.
 - EBMUD has a container at the entrance to its wastewater treatment plant for residents to bring used grease. This bin collected approximately 2,400 gallons in 2008.
 - EBMUD has a hotline phone number and email address for customers to contact us for additional information regarding FOG.
- EBMUD also partners with the nongovernmental organization Baykeeper to expand its FOG control message to residential customers. Information on FOG control is on Baykeeper's website. EBMUD and Baykeeper collaborate to expand the FOG-control message by working with "big box" retailers that sell turkey fryers and with grocers during the holiday season. We provide information to go on the turkey fryers and pull-off tags for use at grocery stores to communicate not to put FOG down the drain and with contact information for EBMUD for additional information.

Comments:

There is a restaurant at the Berkeley Marina (HS Lordships) that has only a grease trap, not an interceptor. This is a hotspot cleaning location for the City. The plan is to install an interceptor at this location. The City owns the property so the City will pay for the interceptor. The City pumps out the grease trap, and also adds enzymes and bioblocks to further control the grease.

The City stated that EBMUD would not have enforcement authority for FOG control on the UC campus.

City staff do not know how many FSEs are present within the city.

The 10 inspectors identified as FOG program staff are also responsible for pollution prevention and industrial user inspections in addition to FOG. One of these staff is a senior inspector whose primary job responsibility is FOG.

PIPE INSPECTION AND CONDITION ASSESSMENT

Gravity Main Inspection

Note: Between 1987 and 1999 the City inspected approximately 170 miles of gravity sewers as the basis for its I/I and Cyclic Replacement Programs. An estimated 80 to 90 miles of gravity sewers have not been inspected.

Describe Pipe Inspection Methods: CCTV Inspection

Miles of Pipe Inspected in the Last 10 Years and Planned Inspection Next 10 Years

(Mains Only):

Date Range	Inspection Method	Miles of Pipe Without Repeats	Useable Condition Assessment	
			Miles of Pipe (Without Repeats)	% of System*
1987 to Present	CCTV	170	170	66%
1987 to Present	Other	0	0	0
Present to 2019	CCTV	50	50	19%
Present to 2019	Other	0	0	0

* System Miles: 388

Describe Planned Pipe Inspection: The City plans to inspect 50 of the remaining 89 miles of gravity sewers that have not been inspected over the next 10 years using CCTV.

Summary of Condition Assessment Findings: NA

Force Mains

Describe Force Main Inspection Methods: All force mains were recently inspected using CCTV.

Describe Program for Inspecting Air Relief Valves: None – There are no air relief valves on the City’s force mains.

Private Laterals

Does the Utility Inspect Private Laterals? No – The City has a private lateral program that requires property owners to inspect their upper laterals upon transfer of title or major remodel.

Number of Private Laterals Inspected 1985 to Present: October 1, 2006 through February 28, 2009: 3,177 certificates were issued

Summary of Inspection Findings: The City does not have reliable information in this area. City Staff believes that many property owners proceed with repair/rehabilitation/replacement rather than submitting a videotape for review under the belief that their laterals would not pass inspection.

Number of Private Laterals Planned for Inspection: The average rate of inspection was 1,200 laterals per year since October 1, 2006. The rate of inspection is driven by real estate sales and major remodels.

Comments

The City's goal is to complete inspection of all pipes over the next 10 years. This includes mains and lower laterals.

The requirement for inspection of private laterals became effective in October 2006. The City estimates about 10 percent of private laterals have been inspected since then. The homeowner has to prove that the lateral is satisfactory by submitting a CCTV tape to the City; or alternatively, produce documentation that the lateral was replaced within the last 20 years (to receive a pro-rated certificate). The CCTV must be done by a licensed contractor, and there are City specifications for the work. The inspection must also show the presence of any illicit connections. The contractor's videotape must include a picture of the street address and the plumber must sign the report under perjury to ensure that the location is actually that claimed for the videotape. The City reviews the tapes and also spot-checks a certain number of laterals. If illicit connections are present, the City issues a deficiency notice. If replacement of the lateral is required, the Planning Department will inspect the replaced lateral. The City verifies property turnover using a list of title transfers obtained from the County. They compare this against their records of lateral certificates. There is a \$500 fine if the homeowner doesn't comply, initially, with increases over time. The private lateral replacement program is not coordinated with the main and lower lateral replacements, although the City is considering some such coordination.

The City's FY 2010/2011 budget eliminates the building inspector position in the Planning Department that was responsible for the private lateral program. Existing staff would take over the assignment.

CAPACITY ASSURANCE

List Locations and Dates of Repeats Capacity Spills: None over the past three years

List Locations of Known Capacity Bottlenecks:

Dry Weather:

None

Wet Weather (5-year event):

One that appears to be related to periodic upstream discharges

Describe I/I Assessments Completed by the Utility (dates, area covered, findings, etc.):

The City completed a sewer system evaluation survey in 1986. Studies have been completed by EBMUD with the most recent completed in 1993. The studies identified Cost-Effective I/I Reduction Projects and developed a 30-year schedule of projects. The City is continuing to work on those projects and has completed the first 23 years of work. The City has engaged RMC Water and Environment to evaluate the capacity of the City's sanitary sewer system and to

recommend projects needed to meet identified capacity deficiencies. This work is planned to be complete in late 2009.

Flow Meters (number, locations): 42

Flowmeters Installed by City = 28

Flowmeters Installed by EBMUD = 14

Describe Flow Model Used by the Utility: RMC Water and Environment is using Wallingford Infoworks CS to model the City's sewer system.

Inflow

Does the Utility Prohibit Storm Water Connections to the Sanitary Sewer (roof drains, sump pumps, etc.)? Yes– See Berkeley Municipal Code 17.06.020, 17.24.030, and 17.24.050.

Describe Program for Enforcing Ban on Illicit Connections: The City has three programs in this area. The City evaluates videotaped inspections of private sewer laterals for indications that there are non-sanitary sewer connections. The City's Code Enforcement Inspectors look for non-sanitary sewer connections to laterals during building permit inspections. The City's Construction Inspectors look for non-sanitary sewer connections while inspecting construction projects.

Describe Program for Locating Illicit Connections (smoke testing, etc.): None at this time

Locations Subject to Street Flooding: No known locations of street flooding

Has the Utility sealed manholes in locations subject to street flooding: NA

I/I Control

Describe I/I Control Projects (miles of pipe rehabilitated or replaced for I/I Control):

Recently Completed Projects: 170 miles of public mains and 68 miles of public lower laterals were rehabilitated or replaced to control I/I since 1987.

Planned Projects: Annual Budgets for I/I Projects are shown below. See City Capital Improvement Budget for project details.

FY 2009/10: \$2.26 Million

FY 2010/11: \$2.26 Million

FY 2011/12: \$2.26 Million

Describe Capacity Control Measures (relief sewers, storage, WWTP expansion, etc.)

Recently Completed Projects: None

Planned Projects: Projects will depend on results of the RMC capacity evaluation project (see above)

Comments

Although the City does not currently perform smoke testing to identify illicit connections, the private lateral replacement program specifically requires that any such connections that are present must be eliminated. Illicit connections are also actively searched for and eliminated during main and lower lateral projects, and during building permit inspections.

The City did not include in the funding for the planned projects for I/I control the additional funding of \$2.26 million per year that is planned to be spent on the Cyclic Replacement Program.

INFRASTRUCTURE RENEWAL AND CAPITAL IMPROVEMENTS

Pipe Rehabilitation and Replacement Methods Used: cured-in-place lining, pipe bursting, and conventional replacement

Miles of Pipe Rehabilitated or Replaced: Last 20 Years and Planned Next 20 Years		
Date Range	Miles of Pipe	% of System (System miles: <u>258 mi of mains;</u> <u>130 mi of laterals</u>)
1987 to present	170 miles of public sewer main 68 miles of public lower lateral	66% of mains 52% of lower laterals
Present to <u>2011</u>	Approximately 4 Miles of Public Sewer Main per Year and Related Lower Laterals (Budget = \$3.3 Million per Year)	1.6% of mains/year

Describe Capacity Improvement Program: The capacity improvements will be identified by the RMC work product described above.

List Major Planned Improvements: The City has a five-year list of sanitary sewer system Capital Improvements (FY 2009 – 2013) that include the mandated I/I Projects. The City has engaged RMC Water and Environment to identify needed capacity enhancement projects.

Describe Master Plan: The City has a Sanitary Sewer System Master Plan Update that was prepared by City Staff in March 2004.

Comment

Information provided by the City states that the City has approximately \$46 million of work to be done on I/I elimination projects during the remaining eight years of the 30-year compliance plan (established by the 1986 Cease and Desist Order). This amount includes the City's Cyclic Replacement Program (cyclic sewer projects). When the program is complete, approximately 70 percent of the system will have been replaced/rehabilitated.

PUMP STATIONS

Name and Location of Pump Station: #1, #2, #3, and #4; Located at Berkeley Marina

Pump Information

<i>Pump #/Name*</i>	<i>Dry or Submersible</i>	<i>Capacity</i>	<i>Constant or Variable</i>	<i>In Service?</i>
1	Submersible	_____	Constant	Yes
2	Submersible	_____	Constant	Yes

* Pumps are 4-Inch Flygt CP 3101 units with 5 HP motors that were installed in 1978.
Each pump station has two pumps.

Pump Station Information:

- A. Average Flow: Not available
- B. Holding Time: Not available
- C. Does Station have Sufficient Pumping Capacity with the Largest Pump Out of Service During:
 - Peak Dry Weather Flow: Yes
 - Peak Wet Weather Flow: Yes
- D. Dry Weather Capacity Limitations? No
- E. Wet Weather Capacity Limitations? No
- F. Number of Failures Resulting in Overflows/Bypass or Backup in the Last Five Years: None
- G. Total Quantity of Overflow/Bypass: NA
- H. Is Dry Well Protected From Wet Well Overflow? NA (Submersible – No Dry Well)
- I. How Often Is Pump Station Inspected? Weekly
- J. Back Up Power Sources And Type:

<i>On-Site Generators</i>	<i>Portable Generators</i>	<i>Back-Up Line from Same Grid?</i>	<i>Back-Up Line from Different Grid?</i>	<i>Other (Describe)</i>
Yes*	No	No	No	

* All Pump Stations have an On-Site Generator except Marina #1.

If Generators On-Site, Describe Testing and Maintenance Procedures: Weekly Auto-Start with 15 Minute Runtime. Monthly On-Site Inspection and Preventive Maintenance by Electrician.

K. Station Alarms:

<i>Low Wet Well</i>	<i>High Wet Well</i>	<i>Power Loss</i>	<i>Unauthorized Entry</i>	<i>Other (Describe)</i>
No	Yes	Yes	No	Gen Start Failed

- A) Is There 24 Hour Coverage for Alarms? Yes
- B) Alarm Signal Sent to: City Emergency Communications Center
- L. What Equipment is Available for Emergency Response? Vacuum On Sewer Cleaning Trucks, One 6-Inch Pump, Three 4-Inch Pumps, Hose and Fittings for Pump-Around.
- M. Are there SCADA Controls? No
If Yes, Ability to Operate Station Remotely? NA

Name and Location of Pump Station: #5; Located at Berkeley Marina

Pump Information

<i>Pump #/Name*</i>	<i>Dry or Submersible</i>	<i>Capacity</i>	<i>Constant or Variable</i>	<i>In Service?</i>
1	Submersible	_____	Constant	Yes
2	Submersible	_____	Constant	Yes

* Pumps are Flygt units with 20 HP motors that were installed in 1998.

Pump Station Information:

- A. Average Flow: Not available
- B. Holding Time: Not available
- C. Does Station have Sufficient Pumping Capacity with the Largest Pump Out of Service During:
 - Peak Dry Weather Flow: Yes
 - Peak Wet Weather Flow: Yes
- D. Dry Weather Capacity Limitations? No
- E. Wet Weather Capacity Limitations? No
- F. Number of Failures Resulting in Overflows/Bypass or Backup in the Last Five Years: None
- G. Total Quantity of Overflow/Bypass: NA
- H. Is Dry Well Protected from Wet Well Overflow? NA (Submersible – No Dry Well)
- I. How Often is Pump Station Inspected? Weekly
- J. Back Up Power Sources and Type:

<i>On-Site Generators</i>	<i>Portable Generators</i>	<i>Back-Up Line from Same Grid?</i>	<i>Back-Up Line from Different Grid?</i>	<i>Other (Describe)</i>
Yes	No	No	No	

If Generators On-Site, Describe Testing And Maintenance Procedures: Weekly Auto-Start with 15 Minute Runtime. Monthly On-Site Inspection and Preventive Maintenance by Electrician.

K. Station Alarms:

<i>Low Wet Well</i>	<i>High Wet Well</i>	<i>Power Loss</i>	<i>Unauthorized Entry</i>	<i>Other (Describe)</i>
No	Yes	Yes	No	Gen Start Failed

- A) Is There 24 Hour Coverage for Alarms? Yes
- B) Alarm Signal Sent to: City Emergency Communications Center
- L. What Equipment is Available for Emergency Response? Vacuum on Sewer Cleaning Trucks, One 6-Inch Pump, Three 4-Inch Pumps, Hose and Fittings for Pump-Around.
- M. Are there SCADA Controls? No
If Yes, Ability to Operate Station Remotely? NA

Name and Location of Pump Station: #6 and #7; Located at Aquatic Park

Pump Information

<i>Pump #/Name*</i>	<i>Dry or Submersible</i>	<i>Capacity</i>	<i>Constant or Variable</i>	<i>In Service?</i>
1	Submersible	_____	Constant	Yes
2	Submersible	_____	Constant	Yes
* Pumps are 4-Inch Flygt CP 3101 units with 5 HP motors that were installed in 2003. Each pump station has two pumps.				

Pump Station Information:

- A. Average Flow: Not available
- B. Holding Time: Not available
- C. Does Station have Sufficient Pumping Capacity with the Largest Pump Out of Service During:
 - Peak Dry Weather Flow: Yes
 - Peak Wet Weather Flow: Yes
- D. Dry Weather Capacity Limitations? No
- E. Wet Weather Capacity Limitations? No
- F. Number of Failures Resulting in Overflows/Bypass or Backup in the Last Five Years: None
- G. Total Quantity of Overflow/Bypass: NA
- H. Is Dry Well Protected from Wet Well Overflow? NA (Submersible – No Dry Well)
- I. How Often is Pump Station Inspected? Weekly
- J. Back Up Power Sources and Type:

<i>On-Site Generators</i>	<i>Portable Generators</i>	<i>Back-Up Line from Same Grid?</i>	<i>Back-Up Line from Different Grid?</i>	<i>Other (Describe)</i>
Yes	No	No	No	

If Generators On-Site, Describe Testing And Maintenance Procedures: Weekly Auto-Start with 15 Minute Runtime. Monthly On-Site Inspection and Preventive Maintenance by Electrician.

K. Station Alarms:

<i>Low Wet Well</i>	<i>High Wet Well</i>	<i>Power Loss</i>	<i>Unauthorized Entry</i>	<i>Other (Describe)</i>
No	Yes	Yes	No	Gen Start Failed

- A) Is There 24 Hour Coverage for Alarms? Yes
- B) Alarm Signal Sent to: City Emergency Communications Center
- L. What Equipment is Available for Emergency Response? Vacuum on Sewer Cleaning Trucks, One 6-Inch Pump, Three 4-Inch Pumps, Hose and Fittings for Pump-Around.
- M. Are there SCADA Controls? No
If Yes, Ability to Operate Station Remotely? NA



Berkeley Photo 1: Pump Station 7 wet well with safety grate.



Berkeley Photo 2: Pump station 7 located next to San Francisco Bay.



Berkeley Photo 3: Pump station 5 wet well.



Berkeley Photo 4: Pump station 5 controls.



Berkeley Photo 5: Pump station 3 wet well.



Berkeley Photo 6: Pump station 3 controls and transfer switch next to marina.