

# Operation and Maintenance Program

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# Operation and Maintenance Program

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This chapter is intended to serve as a standalone document that outlines the daily functions involved in keeping the water system running smoothly. The District’s existing program for proper and efficient operation and maintenance of the water system is documented in the following sections.

## 6.1 Water System Management and Personnel

The District is organized into five divisions, each managed by a division leader:

- Engineering, Engineering Manager
- Customer Service, Controller
- Water Field Operations, Team Leader
- Sewer Field Operations, Team Leader
- Mainline Field Operations, Team Leader

The division leaders and the District’s Planning Engineer report to the General Manager, who in turn reports to the three-member Board of Commissioners. Table 6-1 lists the responsibilities of each management position. In 1999, the District employed 41 staff members. Figure 6-1 is an organization chart of the District’s current staff.

TABLE 6-1  
District Management

| Position            | Responsibilities  |
|---------------------|---|
| General Manager     | Utility management, emergency response, public/press contact  |
| Controller          | Billing, meter reading/meter installation, accounts payable, budget formulation, response to complaints, cross-connection control |
| Engineering Manager | Field engineering, implementation of the improvement program, design and design review  |
| Team Leader         | Normal day-to-day operations, preventive maintenance, water quality monitoring  |

Field operations are organized into three divisions: the Water Crew, the Sewer Crew, and the Mainline Crew. The Water and Mainline Crews will be the focus of this section because their activities relate to water operations. The Water Crew is managed by its team leader, who is aided by an administrative assistant who works with all three crews. Five field technicians work directly for the Water Crew team leader, and they are aided by two full-time operators-in-training (OITs), whose duties are divided among the three crews. The Water Crew is responsible for water treatment, water quality monitoring, storage tank maintenance, system operations, and meter installation. The three-member Mainline Crew is responsible for hydrant and valve maintenance, water service installations, main break

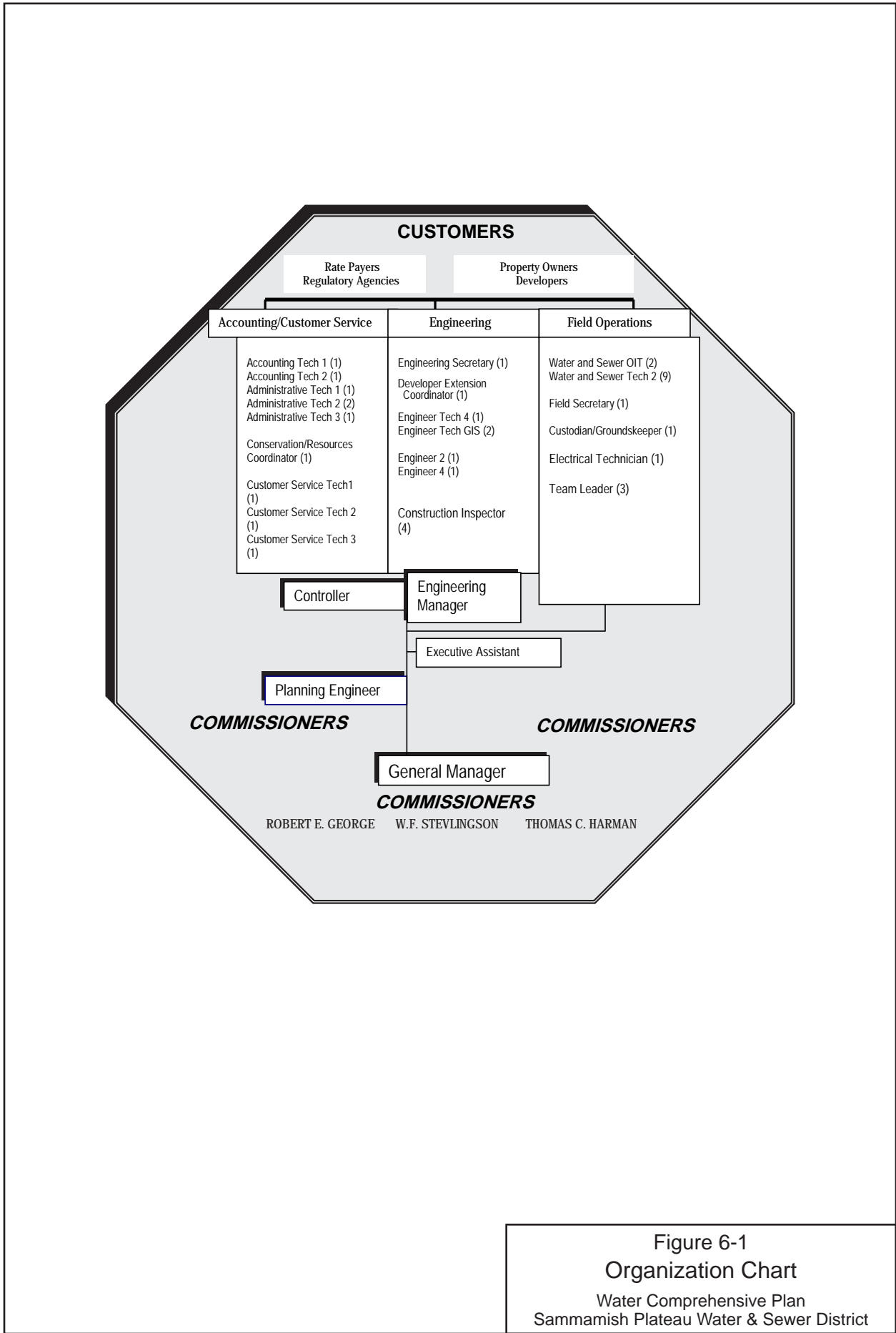


Figure 6-1  
 Organization Chart  
 Water Comprehensive Plan  
 Sammamish Plateau Water & Sewer District

repairs, and watermain replacement projects that are limited in scope. During the summer months, two to four part-time employees (PTEs) are hired to assist with landscape maintenance and painting of facilities throughout the District. Often, two PTEs are dedicated to the Water Crew, but additional support may be obtained from the other two PTEs. Two full-time customer service representatives handle all water meter related projects. Although customer service is organized within the Controller's division, it is discussed here because customer service personnel perform water system related work.

Table 6-2 summarizes the number of positions and the number of full-time employees (FTEs) currently used for water-related work. Based on this information, there are approximately 12.50 FTEs performing work related to the water system.

**TABLE 6-2**  
Current Water System Field Operations Full-Time Employees

| <b>Position</b>   | <b>Equivalent Operations FTE</b>      |
|---|---------------------------------------|
| Water Crew Team Leader  | 1.0                                   |
| Administrative Assistants<br>(Water, Sewer, and Mainline Crews) | 1.0                                   |
| Field Technicians   | 5.0                                   |
| Operators-in-Training   | 2.0                                   |
| Summer PTEs   | 0.5 (2 positions x 3 mo ÷ 12 mo/year) |
| Customer Service Representatives<br>(Water and Sewer Crews)     | 3.0                                   |
| <b>Total</b>  | <b>12.5</b>                           |

## 6.2 Certification, Training, and Membership in Professional Organization

### 6.2.1 Certification and Training Requirements

All members of the Water Crew are certified distribution system operators, as are two of the three customer service representatives. Under the 1996 amendments to the Safe Drinking Water Act, new operator certification requirements for Group A water systems are being developed. By February 2001, it is anticipated that water treatment operator certification will be required for the District's corrosion control facilities and future chlorine, fluoride, and manganese removal/sequestering facilities. Two of the District's staff are certified as Class 1 treatment plant operators.

Table 6-3 presents a complete list of certifications and the number of employees that hold each of the certifications.

**TABLE 6-3**  
Current Water System Field Operations Personnel Certifications

| Certification                                       | Employees<br>with<br>Certification |
|---|------------------------------------|
| Backflow Assembly Tester (BAT) Professional         | 2                                  |
| Cross Connection Control Manager                    | 1                                  |
| Cross Connection Control Specialist 1               | 18                                 |
| CDL Driver  | 14                                 |
| First Aid/CPR                                       | 15                                 |
| Flaggers  | 14                                 |
| Forklift Trained                                    | 13                                 |
| Safety and Health Specialist                        | 1                                  |
| Water Distribution Manager 1                        | 3                                  |
| Water Distribution Manager 2                        | 5                                  |
| Water Distribution Manager 3                        | 2                                  |
| Water Distribution Manger 4                         | 2                                  |
| Water Distribution Specialist 1                     | 3                                  |
| Water Distribution Specialist 2                     | 11                                 |
| Water Treatment Plant Operator Operator In Training | 1                                  |
| Water Treatment Plant Operator 1                    | 3                                  |
| Water Treatment Plant Operator 3                    | 1                                  |

## 6.2.2 Training and Professional Organization Membership

Annually, the District budgets for personnel training, certification, and membership in professional organizations such as the American Water Works Association (AWWA). The amount budgeted is approximately 6 percent of the gross salary amount. This amount provides personnel with the opportunity to attend a large number of training sessions available annually.

Membership in AWWA also helps personnel keep up with the state-of-the-art in management and operations of water utilities. The management of the District believes that the time and money invested in training, certification, and membership in professional organizations are repaid many times in improved pride, safety, skill, and confidence.

## 6.3 System Operation and Control

### 6.3.1 Identification of Major System Components

Table 6-4 presents a summary of the major system components. Descriptions and locations of each individual component are presented in Chapter 3.

TABLE 6-4  
Major System Components

| Component                    | Zone Served           | Current Production Rate  |
|------------------------------|-----------------------|--------------------------|
| <b>Wells</b>                 |                       |                          |
| Well 1R                      | Plateau/650 zone      | 500 gpm                  |
| Well 2                       | Plateau/650 zone      | 460 gpm                  |
| Well 2R                      | Plateau/650 zone      | Not currently in service |
| Well 3                       | Plateau/700 zone      | Not currently in service |
| Well 4                       | Plateau/700 zone      | 780 gpm                  |
| Well 5                       | Plateau/700 zone      | Not currently in service |
| Well 6                       | Plateau/650 zone      | Not currently in service |
| Well 7                       | Plateau/297 zone      | 2,200 gpm                |
| Well 8                       | Plateau/297 zone      | 3,500 gpm                |
| Well 9                       | Plateau/297 zone      | 2,300 gpm                |
| Well 10                      | Plateau/650 zone      | 600 gpm                  |
| Well 11.1                    | Plateau 700 zone      | 500 gpm                  |
| Well 11.2                    | Plateau/700 zone      | 1,600 gpm                |
| Well 12                      | Cascade View/730 zone | 175 gpm                  |
| Well 13                      | Cascade View/730 zone | 170 gpm                  |
| Well 14                      | Cascade View/730 zone | 100 gpm                  |
| Well 15                      | Plateau/650 zone      | Not currently in service |
| <b>Tanks</b>                 |                       |                          |
| 3 MG                         | Plateau/700 zone      |                          |
| 2 MG                         | Plateau/650 zone      |                          |
| 7 MG                         | Plateau/650 zone      |                          |
| 297 Tank                     | Plateau/297 zone      |                          |
| Well 12 Tank                 | Cascade View/730 zone |                          |
| Well 13 Tank                 | Cascade View/730 zone |                          |
| Control Tank                 | Plateau/475 zone      |                          |
| <b>Booster Pump Stations</b> |                       |                          |
| 43rd Booster                 | Plateau/650 zone      |                          |
| Pump 1 (150 hp)              |                       | 1,000 gpm                |
| Pump 2 (250 hp)              |                       | 1,800 gpm                |

**TABLE 6-4**  
Major System Components

| Component                    | Zone Served      | Current Production Rate |
|------------------------------|------------------|-------------------------|
| <b>Booster Pump Stations</b> |                  |                         |
| 297 Booster                  | Plateau/650 zone |                         |
| Pump 1 (150 hp)              |                  | 1,000 gpm               |
| Pump 2 (450 hp)              |                  | 3,200 gpm               |
| Well 4 Booster               | Plateau/700 zone |                         |
| Pump 1 (50 hp)               |                  | 1,500 gpm               |
| Pump 2 (15 hp)               |                  | 500 gpm                 |
| Pump 3 (10 hp)               |                  | 226 gpm                 |

The District is divided into two separate and hydraulically independent areas: the Plateau Zone and the Cascade View Zone.

#### 6.3.1.1 Plateau Zone

The north end of the Plateau Zone is served by Wells 4, 11.1, and 11.2, plus the Well 4 booster pump station and one tank (3 MG tank). The booster pump station can transfer water from the 650 zone to the 700 zone. The Plateau Zone has three interties with Northeast Sammamish Sewer and Water District in the 700 zone.

The south end of the Plateau Zone is served by Wells 1, 2, 7, 8, 9, and 10 with the two booster pump stations (297 booster and the 43rd booster), four tanks (Control Tank, 297 Tank, 2 MG, and 7 MG), and two interties with the City of Issaquah.

Wells 1, 2, 4, 7, and 10 are the primary wells during the winter months (from November to April). Pump 1 from the 297 booster pump station and the two pumps at the 43rd booster pump station pump into the two main reservoirs (the 2 MG and the 7 MG) in the 650 zone.

Wells 1, 2, 4, 8, 10, 11.1, and 11.2 are the primary wells during the summer months (from April to November). Pump 1 at 297 and sometimes Pump 2 at the 297 booster pump station, along with Pumps 1 and 2 from the 43rd booster pump station, pump during the summer months. Well 9 is for emergency backup.

If necessary, the Northeast Sammamish Sewer and Water District can operate the north end of the Plateau Zone through the interties when District wells are offline, or the District can operate the zone with the Well 4 booster pump station when the tank is offline for cleaning or maintenance.

Well 4 can pump to the south end of the Plateau Zone if necessary. One of the 650 Zone tanks can be taken offline for periodic maintenance. The 297 Tank can be bypassed if necessary for cleaning or maintenance.

#### 6.3.1.2 Cascade View Zone

The Cascade View system is served by Wells 12, 13, and 14 with two tanks and an intertie with Union Hill. Wells 12 and 13 are the primary supply wells during winter and summer

months. Well 14 is used for emergency backup. Either tank can be taken offline for cleaning purposes while Wells 12 and 13 still operate.

### 6.3.2 Routine System Operation

Table 6-5 provides a list of tasks and the staff hours required to complete tasks associated with the water system. One FTE is equivalent to 2,000 staff hours (40 hours per week for 50 weeks). Based on the estimated staff hours needed to complete a task, the equivalent FTE required to complete this task was calculated. The estimated hours and equivalent FTEs are totaled for comparison with the existing water staff. The water system activities were calculated to require 13.50 FTEs.

TABLE 6-5  
Routine Operation and Preventive Maintenance Staffing Level Evaluation

| Task                             | Activity  | Frequency          | Staff Hours  | Annual Staff Hours | Equivalent FTE |
|----------------------------------|---|--------------------|--|--------------------|----------------|
| <b>Water Distribution System</b> |   |                    |  |                    |                |
| Water Main Maintenance           | Flush dead-end lines annually or as required by customer inquiry  | Annually           | 0.33 hrs/dead end x 300 dead ends (approx) x 1.5 staff                               | 149                | 0.07           |
| Valve Maintenance                | Operate full open/closed; uncover where buried; clean out valve boxes; repair as necessary  | Annually           | 1.5 hrs/valve x 2,802 valves x 1.5 staff   | 6,305              | 3.15           |
| Hydrant Maintenance              | Operate; check drain rate; lubricate as necessary; measure pressure; paint as required  | Annually           | 40 hrs/week x 8 weeks/year x 2 staff   | 640                | 0.32           |
| PRV Maintenance                  | Cycle all valves, check screens and pressure settings; check and clean vault drains as necessary; rebuild as necessary  | Annually           | 3 hrs/PRV x 43 PRVs x 2 staff  | 258                | 0.13           |
| Intertie Maintenance             | Painting, general maintenance   | Twice per week     | 1 hr/intertie x 3 interties x 2 visits/week x 52 weeks x 2 staff                     | 624                | 0.31           |
| Meter Reading                    | Read meters, note meter malfunctions  | Once every 8 weeks | 40 hrs/wk x 52 weeks x 2 staff   | 4,160              | 2.08           |
| Distribution System Monitoring   | Collect bacteriological   | Weekly             | (6 hrs/day x 4 day/month x 12 mo/yr x 1.5 staff) + (40 hrs x twice yearly x 2 staff) | 592                | 0.30           |
|                                  | Collect lead/copper samples   | Twice yearly       |  |                    |                |
| <b>Wells and Reservoirs</b>      |   |                    |  |                    |                |
| General Site Maintenance         | Check facility for security   | Weekly             | 2 hrs/well x twice weekly x 52 weeks x 16 wells x 2 staff                            | 6,656              | 3.23           |
| Pump Maintenance                 | Log and record motor amperage draws, check packing, log gallons of water delivered, log pump motor hours; check oil level; check motor noise, temperature, and vibration; change motor oil annually | Twice per week     |  |                    |                |
| Reservoir Maintenance            | General maintenance   | Twice per week     | 0.75 hr/tank x twice weekly x 52 weeks x 7 reservoirs x 2 staff                      | 1,092              | 0.55           |
| Source Monitoring                | Collect VOC, IOC, radiological, and other samples   | Once every 3 years | 40 hrs x 1/3 yearly x 2 staff  | 27                 | 0.01           |

**TABLE 6-5**  
Routine Operation and Preventive Maintenance Staffing Level Evaluation

| Task                                    | Activity   | Frequency           | Staff Hours  | Annual Staff Hours | Equivalent FTE |
|---|--|---------------------|--|--------------------|----------------|
| <b>Booster Pump Stations</b>            |  |                     |  |                    |                |
| General Pump Station Site Maintenance   | Check facility for security  | Weekly              | 1.5 hrs/station x twice weekly x 52 weeks x 3 booster stations x 2 staff | 936                | 0.47           |
| Pump Maintenance                        | Log and record motor amperages draws, check packing, log gallons of water delivered, log pump motor hours; check oil level; check motor noise, temperature, vibration, and discharge pressure; change motor oil annually | Twice per week      |  |                    |                |
| <b>General Maintenance</b>              |  |                     |  |                    |                |
| Vehicle Checks                          | Follow fleet safety program; check all fluids and lights, brakes, and other safety-related items; complete vehicle log   | Daily               | 0.25 hrs x 260 days x 12 vehicles (1/3 of 35 vehicles)                   | 780                | 0.39           |
| Vehicle Maintenance                     | Replace fluids and filters   | Once every 3 months | Transport to outside services (0.5 hrs/vehicle x 23 vehicles)            | 11.5               | 0.01           |
| Tool Maintenance                        | Clean after each use; lubricate and maintain as necessary; sterilize all equipment, if necessary   | Weekly              | 2 hrs/week x 52 weeks/yr   | 104                | 0.05           |
| <b>Cross-Connection Control Program</b> |  |                     |  |                    |                |
| Comply with Program                     | Inspections, inquiry response, recordkeeping, public education, etc. (see Table 6-13)  | As required         | See Table 6-13   | 1,351              | 0.68           |
| <b>Administration</b>                   |  |                     |  |                    |                |
| Daily Reports                           | Compose, produce, and file daily reports; purchasing; general administration   | Daily               | 40 hrs/wk x 52 weeks   | 2,080              | 1.04           |
| PH and Chlorine Monitoring              | Monitor pH and chlorine levels at dosing points and points downstream  | Daily               | 1 hr x 260 days  | 260                | 0.13           |
| Locate Water Mains                      | Locate mains for developers  | As required         | 4 hrs x 260 days   | 1,040              | 0.52           |
| <b>Emergency Repairs</b>                |  |                     |  |                    |                |
| Emergency Repairs                       | Repairs  | Weekly              | 4 hrs/week x 52 weeks x 3 staff  | 624                | 0.31           |
| <b>Total</b>                            | (1 staff = 2,000 hours annually)   |                     |  | <b>27,689.5</b>    | <b>13.84</b>   |
| <b>Current Staff</b>                    |  |                     |  |                    | <b>12.5</b>    |

### 6.3.2.1 Minor Emergency Response

Notwithstanding catastrophic disasters that will be addressed in the detailed emergency plan, the District is well equipped to deal with reasonably anticipated emergencies. The District's capabilities are described below:

1. **Multiple Water Sources.** The District has 12 wells currently in use and 3 booster stations. Three separate Puget Sound Energy substations serve these facilities.
2. **Emergency Electrical Power Source (Engine Generator).** Three wells (1, 4, and 9) and two booster pump stations (297 and Well 4) are operated by stationary diesel generators during periods of extended power outage. The office is also powered by a stationary

diesel generator during power outages. Portable generators are available at the District office to provide power to the other wells and booster pump stations.

3. **Multiple Water Storage Tanks.** The District's six storage tanks allow the District to maintain adequate storage if one of its tanks is out of service. Three other major storage facilities are in the design stage for construction in 2001.
4. **Vulnerability Analysis.** A vulnerability analysis of the distribution system was performed to determine pipeline looping requirements. Many existing dead ends have now been looped.
5. **Emergency Equipment.** The District is equipped with radio-dispatched vehicles that have the necessary tools to deal with routine emergencies. To respond to a serious emergency, the District has a step van equipped with most repair parts. Two backhoes and two dump trucks are also available for emergencies such as pipeline failures. Emergency lights and generators are available with safety equipment. The District is also a member of the Washington Association of Sewer and Water Districts (WAS&WD) mutual aid program.
6. **Emergency Telephone.** Customers can call a 24-hour telephone number (425-392-6256) to contact the Manager and Operations Crew.
7. **On-Call Personnel.** The two on-call staff are equipped with service vehicles and cellular telephones, and the primary on-call staff-person has a laptop computer for remote connection to the telemetry system and District local area network. The response time is generally less than 40 minutes. A list of emergency telephone numbers is provided to each on-call employee. New employees do not perform on-call duties until they are familiar with the water system and maintenance procedures.

### 6.3.2.2 Standard Operating Procedure

In addition to the tasks listed in Table 6-5, there are specific procedures for start-up, shutdown of the wells, and performance evaluation:

#### Start-Up Procedures for the Wells

1. Check all valves to make sure they are in the correct positions.
2. Check power supply to make sure nothing is locked off or tagged out.
3. Check oil and packing.
4. Pre-lube column 15 to 20 minutes.
5. Make sure mainline valve is shut.
6. Start and flush well for approximately 20 minutes two to three times or until water is clear.
7. Take bacteriological sample and wait for results.

#### Shutdown Procedures for the Wells

1. Shut off mainline valve to the system.
2. Check power to make sure it is off and tag out.

3. Winterize if necessary.

### System Performance Evaluation

1. The telemetry system is monitored 24 hours per day. The on-call staff member is notified via telephone dialer if there are any problems.
2. The on-call staff member uses the laptop computer to monitor and control the telemetry system from home or in the field.
3. Collect field information to provide to the Engineering Department and Planning Engineer, who compare the field results to the predicted results from the District's hydraulic analysis model, Cybernet.

### 6.3.3 Preventive Maintenance Program

In addition to routine operations, the District performs activities to ensure continued operations with minimal disruptions due to equipment failure. The maintenance program comprises: (1) preventive maintenance at the wells, booster pump stations, and mains and (2) extraordinary conditions that require major equipment be taken offline for maintenance. Table 6-6 summarizes these activities.

**TABLE 6-6**  
Preventive Maintenance Program and Extraordinary Conditions

| Facilities                      | Activities   |
|---------------------------------|--|
| <b>Preventive Maintenance</b>   |  |
| Wells and Booster Pump Stations | <p>Initial vibration tests are performed when a well first comes online. Subsequent vibration tests are performed approximately every 5 years unless there is a problem, in which case they are performed more frequently.</p> <p>Lubricating oil in the motors at the wells and the boosters is changed once or twice per year depending on the number of hours the pumps run.</p> <p>Probes on the stationary pH monitors at the caustic sites are cleaned and calibrated monthly to ensure accuracy. The hand-held probes are cleaned and calibrated monthly or more frequently if needed.</p> <p>The outsides of the storage tanks are pressure-washed approximately every 3 years unless it is needed sooner.</p> <p>Pressure-reducing valves are checked every spring for pressure, and old parts are replaced as needed. The drains in the vaults are cleaned at the same time to avoid clogging.</p> |
| Water Mains                     | <p>All dead end water mains are flushed annually to ensure safe and reliable drinking water.</p> <p>Fire hydrant maintenance is performed annually to ensure safe operation and reliability. The fire department is notified when a hydrant is out of service. The District is responsible for making repairs.</p>   |
| <b>Extraordinary Conditions</b> |  |
| 3-MG Tank                       | When the 3-MG Tank is offline, Wells 4 and 11 cannot operate. This would occur primarily when the tank is cleaned or if it became contaminated. The Well 4 boosters can supply domestic and fire flows to the north end of the Plateau Zone without the tank being online, thus avoiding an interruption of service.   |
| 297 Tank                        | If the 297 Tank is offline for cleaning or decontamination, the 43rd booster and Well 7 can pump water to the 650 zone.  |
| Wells 7 and 8                   | If Wells 7 and 8 are out of service at the same time, Well 9 can be operated to provide sufficient supply.   |

### 6.3.4 Chemicals, Equipment, Supplies, and Maintenance Contractors

Table 6-7 provides a list of vendors the District uses for chemical, equipment, and part supplies and maintenance contractors.

**TABLE 6-7**  
Chemicals, Equipment, Supplies, and Maintenance Contractors

|                                | Supplier                                     | Contacts       | Notes  |
|--------------------------------|--|----------------|--|
| <b>Chemicals</b>               |  |                |  |
| Sodium Hydroxide (Caustic)     | Great Western Chemical Company (Seattle)     | (206) 763-2350 | 11,400 gallons in stock (1,500 gallons each at Wells 1 and 10 and 8,400 gallons at Well 9)         |
| Sodium Hypochlorite (Chlorine) | Van Waters & Rogers (Kent)                   | (800) 562-4860 | 300 gallons in stock (300 gallons at Well 4)   |
| Coarse Rock Salt               | Grange Farm & Home Supply (Issaquah)         | (425) 392-6469 | 2,450 lbs in stock<br>600 lbs at Well 11.1   |
|                                | Round Butte Products (Washougal)             | (800) 850-7258 |  |
| <b>Equipment/Power</b>         |  |                |  |
| Chlorine Pumps                 | TMG Services (Maple Valley)                  | (800) 562-2310 |  |
| Control Valves                 | GC Systems (Sumner)                          | (800) 525-9425 |  |
| Caustic Pumps (Injection Pump) | Milton Roy (Ivyland, PA)                     | (215) 441-0800 |  |
| Well Pumps                     | U.S. Motors, GE Motors                       | (206) 762-0500 |  |
|                                | Cascade Machinery                            |                |  |
| Well Service                   | Pump Tech (Bellevue)                         | (425) 644-8501 |  |
| Electric Power                 | Tanner Electric (Snoqualmie)                 | (425) 888-0623 | Puget Sound Energy supplies power to most wells; Tanner Electric supplies power to Wells 12 and 14 |
|                                | Puget Sound Energy (Bellevue)                | (800) 321-4123 |  |
| Diesel Fuel                    | Ray F. Snyder Company (Texaco) (Kirkland)    | (800) 255-6852 |  |
| <b>Supplies/Parts</b>          |  |                |  |
| Miscellaneous Parts            | Familian Northwest (Woodinville)             | (360) 757-9794 |  |
| Miscellaneous Parts            | H.D. Fowler Company (Bellevue)               | (800) 487-5290 |  |
| Miscellaneous Parts            | U.S. Filter/Pacific Waterworks (Woodinville) | (800) 566-1568 |  |

**TABLE 6-7**  
Chemicals, Equipment, Supplies, and Maintenance Contractors

|   | <b>Supplier</b>                            | <b>Contacts</b> | <b>Notes</b>                 |
|---|--|-----------------|------------------------------|
| Meters  | Western Utilities Supply Company (Seattle) | (800) 426-8310  |                              |
| Meters  | Fogtite (Seattle)                          | (206) 935-8000  |                              |
| Electrical Supplies                           | Stusser Electric (Bellevue)                | (425) 454-3339  |                              |
| Batteries                                     | Interstate Batteries of Seattle (Seattle)  | (800) 562-3212  |                              |
| <b>Maintenance Contractors</b>                |  |                 |                              |
| Generator Maintenance                         | Cummins Northwest, Inc (Renton)            | (425) 235-3400  |                              |
| Telemetry Maintenance                         | TSI (Lynnwood)                             | (800) 509-4357  |                              |
| PLCs for Telemetry                            | ICS  |                 |                              |
| Groundwater Protection                        | CDM/AGI (Gig Harbor)                       | (253) 851-5562  |                              |
| Water Testing                                 | AmTest (Redmond)                           | (425) 885-1664  | Certified Testing Laboratory |
| Communication (Mobile Radios and Base Radios) | Wentz Electronics (Snoqualmie)             | (425) 888-0939  |                              |
| Preventive Maintenance Program                | Cartégraph (Dubuque, IA)                   | (800) 688-2656  |                              |

## 6.4 Comprehensive Monitoring (Regulatory Compliance) Plan

Water quality monitoring requirements for groundwater, surface water, and combined source systems are listed in Table 3-4. The monitoring programs are described below. The complete water quality monitoring plans are provided in Appendix T.

### 6.4.1 Bacteriological Monitoring Plan

The District's current Bacteriological Monitoring Plan for bacteriological samples is in accordance with WAC 246-290. Chapter 3 outlines the sampling schedule. Currently, 40 samples are required. The District collects 42 samples each month (10 per week minimum), which are tested at certified laboratories. The sample locations are listed in Table 6-8. The introduction of regional water into the existing water system will require new locations for sample collection. The number of samples will depend on the size of the population served and the zones where groundwater is blended with regional water.

**TABLE 6-8**  
Monthly Bacteriological Monitoring Locations

| <b>Location</b>                                       | <b>Address</b>                | <b>City</b>             |
|---|-------------------------------|-------------------------|
| Well 13 Pump Room                                     | 26002 NE 70th St              | Unincorporated King Co. |
| Well 12 Pump Room                                     | 26410 NE 50th St              | Unincorporated King Co. |
| Broadhurst  | 25920 NE 29th PI              | Unincorporated King Co. |
| Broadmore Estates                                     | 24010 NE 30th PI              | Sammamish               |
| Devereaux   | 2404 NE 244th PI              | Sammamish               |
| Crosse Creek  | 823 - 258th Ave NE            | Unincorporated King Co. |
| Shannonwood   | 1639 - 209th PI NE            | Sammamish               |
| By the 3-MG Tank                                      | 22202 NE 12th PI              | Sammamish               |
| Cimarron  | 23107 NE 14th St              | Sammamish               |
| Tree Farm (above barrel)                              | 407 - 238th Ave NE            | Sammamish               |
| Taco Time (east side of building)                     | 403 - 228th Ave NE            | Sammamish               |
| Well 4  | 23001 Main St                 | Sammamish               |
| Shop  | 1510 - 228th Ave SE           | Sammamish               |
| Residence   | 24421 SE 4th PI               | Sammamish               |
| Golf Course Maintenance Building                      | 25775 E. Plateau Dr           | Sammamish               |
| Trossach's  | 2214 – 275th Ct SE            | Sammamish               |
| Residence   | 21828 SE 1st St               | Sammamish               |
| Beaver Lake County Park (Left side of main building)  | 25005 SE 24th St              | Sammamish               |
| By Well 1   | 2847 – 241st Ave SE           | Sammamish               |
| Residence   | 3045 – 249th Ave SE           | Sammamish               |
| Bob George's house (by kitchen door )                 | 3030 E Beaver Lake Dr SE      | Sammamish               |
| High Country (by garage)                              | 2917 – 266th Ave SE           | Sammamish               |
| Klahanie East   | 4040 – 262nd PI SE            | Unincorporated King Co. |
| Klahanie Information Center (left side of building)   | 244th Place SE @ 244th Ave SE | Unincorporated King Co. |
| Hunter Ridge  | 4624 – 247th Ave SE           | Unincorporated King Co. |
| Highland Park   | 4708 – 227th Ave SE           | Sammamish               |
| 297 Tank  | 22664 SE 56th St              | Issaquah                |
| 43rd Booster  | 21985 SE 43rd St              | Unincorporated King Co. |
| Black Nugget Road Cantor Grove                        | 5419 – 247th PI SE            | Unincorporated King Co. |
| Well 7 Pump Room                                      | 6651 E Lake Samm Pkwy SE      | Issaquah                |
| Well 8 Pump Room                                      | 6651 E Lake Samm Pkwy SE      | Issaquah                |
| Providence Point Town Hall (outside hose bib by door) | SE 43rd Way at 226th Ave SE   | Unincorporated King Co. |
| Marionwood Center (employee lounge sink)              | 228th Avenue SE at SE 38th St | Unincorporated King Co. |

**TABLE 6-8**  
Monthly Bacteriological Monitoring Locations

| <b>Location</b>                           | <b>Address</b>          | <b>City</b> |
|---|-------------------------|-------------|
| Eagle Ridge                               | 4138 - 205th Ave SE     | Sammamish   |
| Sammamish Woods (front window)            | 19605 SE 23rd St        | Sammamish   |
| Waverly Hills                             | 19645 SE 29th St        | Sammamish   |
| Pine Lake Heights (by garage)             | 2814 - 217th Ave SE     | Sammamish   |
| Fire Station # 4 (south side of building) | 2030 - 212th Ave SE     | Sammamish   |
| Residence (by garage door)                | 714 - 199th Ave SE      | Sammamish   |
| Residence (by garage)                     | 22 Louis Thompson Rd SE | Sammamish   |
| Tamarack (by garage)                      | 230 - 211th PI NE       | Sammamish   |

#### 6.4.2 Inorganic Chemical, Physical Contaminant, Organic Chemical, Radionuclide Monitoring Plan

The District's current Inorganic Chemical, Physical Contaminant, Organic Chemical, and Radionuclide Monitoring Plans are in accordance with WAC 246-290. Samples are collected at all entry points to the distribution system, after the sources have been combined, and after treatment. Sample collection occurs during periods of normal operating conditions. Sample locations are located at the wells and are listed in Table 6-9. If regional water is introduced into the existing water system and the proposed treatment at the wells and reservoirs is implemented, revisions to the monitoring plan will be required. The number of samples will depend on the definable areas where groundwater is blended with regional water.

**TABLE 6-9**  
Inorganic Chemical, Physical Contaminant, Organic Chemical, Radionuclides Monitoring Locations

| <b>Location</b>                         | <b>Address</b>                    | <b>City</b>             |
|---|-----------------------------------|-------------------------|
| Well 1                                  | 2810 - 241st Ave SE               | Sammamish               |
| Well 2                                  | 3401 E. Beaver Lake Dr SE         | Sammamish               |
| Well 4                                  | 23001 Main St                     | Sammamish               |
| Well 7                                  | 6503 E. Lake Sammamish Parkway SE | Issaquah                |
| Well 8                                  | 6651 Lake Sammamish Parkway SE    | Issaquah                |
| Well 9                                  | 940 - 1st Ave NE                  | Issaquah                |
| Well 10                                 | 25025 SE 32nd Way                 | Unincorporated King Co. |
| Well 11                                 | 400 - 228th Ave NE                | Sammamish               |
| Well 12 (Cascade View)                  | 26410 NE 50th St                  | Unincorporated King Co. |
| Well 13 (Cascade View)                  | 26002 NE 70th St                  | Unincorporated King Co. |
| Well 14 (Cascade View [limited access]) | 26120 NE 36th PI                  | Unincorporated King Co. |

### 6.4.3 Lead and Copper Monitoring Plan

The District completed a Corrosion Control Study (Kennedy/Jenks, May 1999) in response to exceedances of lead and copper action levels. A corrosion control system successfully reduced these levels in systems served by Wells 1, 7, 8, 9, and 10, and the District is in the process of installing corrosion control systems on Well 2. Based on these modifications, the District sampled at 60 locations in 1999 in compliance with WAC 246-290. The monitoring locations are listed in Table 6-10.

**TABLE 6-10**  
Lead and Copper Monitoring Locations

| <b>Location</b>        | <b>Address</b>           | <b>City</b> |
|------------------------|--------------------------|-------------|
| Residence              | 2907 - 202nd Pl SE       | Sammamish   |
| Pine Hill              | 23402 SE 17th Pl         | Sammamish   |
| Woodcreek Acres        | 22303 SE 18th Ct         | Sammamish   |
| Woodcreek Acres        | 22304 SE 18th Ct         | Sammamish   |
| Residence              | 25206 SE 18th Pl         | Sammamish   |
| Residence              | 21407 SE 20th St         | Sammamish   |
| Residence              | 22504 SE 20th St         | Sammamish   |
| Residence              | 21420 SE 24th St         | Sammamish   |
| Sunny Hills Estates    | 24528 SE 30th St         | Sammamish   |
| Pine Lake Highlands    | 3205 - 216th Ct SE       | Sammamish   |
| The Ridge at Pine Lake | 21231 SE 37th St         | Sammamish   |
| The Ridge at Pine Lake | 21533 SE 37th St         | Sammamish   |
| The Ridge at Pine Lake | 21802 SE 38th Pl         | Sammamish   |
| Sunrise Summit         | 2018 - 205th Ave SE      | Sammamish   |
| Rockmeadow             | 3500 - 207th Ave SE      | Sammamish   |
| Sunrise Summit         | 2128 - 205th Ave SE      | Sammamish   |
| Pine Brook Meadows     | 21238 SE 28th St         | Sammamish   |
| Pine Brook Meadows     | 2821 - 213th Ave SE      | Sammamish   |
| Pine Brook Meadows     | 3126 - 213th Pl SE       | Sammamish   |
| Klahanie               | 25645 SE 41st St         | Issaquah    |
| Klahanie               | 23953 SE 42nd Pl         | Issaquah    |
| Klahanie               | 4349 - 239th Pl SE       | Issaquah    |
| Klahanie               | 24224 SE 44th St         | Issaquah    |
| Klahanie               | 24229 SE 44th St         | Issaquah    |
| Residence              | 1920 W Beaver Lake Dr SE | Sammamish   |
| Loree Estates          | 20037 SE 19th St         | Sammamish   |
| Loree Estates          | 1803 - 203rd Ave SE      | Sammamish   |
| Loree Estates          | 1810 - 203rd Ave SE      | Sammamish   |
| Inglewood              | 1547 - 211th Ave NE      | Sammamish   |
| Shannonwood            | 1627 - 209th Pl NE       | Sammamish   |
| Shannonwood            | 1809 - 211th Ct NE       | Sammamish   |

**TABLE 6-10**  
Lead and Copper Monitoring Locations

| <b>Location</b>   | <b>Address</b>      | <b>City</b>             |
|-------------------|---------------------|-------------------------|
| Shannonwood       | 1840 - 211th Ct NE  | Sammamish               |
| Shannonwood       | 21031 NE 17th St    | Sammamish               |
| Inglewood         | 741 - 218th PI NE   | Sammamish               |
| Washington Park E | 116 - 217th Ave NE  | Sammamish               |
| Washington Park E | 21911 NE 1st St     | Sammamish               |
| Tamarack          | 47 - 210th PI NE    | Sammamish               |
| Burke Farrars     | 1244 - 218th Ave NE | Sammamish               |
| Rosaia Estates    | 930 - 218th Ave NE  | Sammamish               |
| Inglewood Glen    | 21221 NE 13th Ct    | Sammamish               |
| Inglewood Glen    | 22107 NE 13th PI    | Sammamish               |
| Inglewood Glen    | 1328 - 222nd PI NE  | Sammamish               |
| Inglewood Glen    | 1301 - 224th PI NE  | Sammamish               |
| Residence         | 723 - 212th Ave SE  | Sammamish               |
| Residence         | 415 - 221st Ave NE  | Sammamish               |
| Inglewood Glen    | 22263 NE 7th St     | Sammamish               |
| Green Acres       | 1818 - 226th PI NE  | Sammamish               |
| Green Acres       | 22512 NE 19th St    | Sammamish               |
| Cimarron Div 1    | 1305 - 229th PI NE  | Sammamish               |
| Cimarron Div 1    | 1329 - 229th PI NE  | Sammamish               |
| Cimarron Div 1    | 22922 NE 14th St    | Sammamish               |
| Hecate Hill       | 2402 - 245th PI NE  | Unincorporated King Co. |
| Residence         | 24206 NE 22nd St    | Sammamish               |
| Tree Farm         | 23703 NE 4th St     | Sammamish               |
| Tree Farm         | 23705 NE 4th PI     | Sammamish               |
| Tree Farm         | 24240 NE 5th PI     | Sammamish               |
| Tree Farm         | 24102 NE 6th PI     | Sammamish               |
| Tree Farm         | 23617 NE 6th St     | Sammamish               |
| Tree Farm         | 418 - 239th Ave NE  | Sammamish               |
| Cascade View      | 4010 - 266th Ave NE | Unincorporated King Co. |
| Cascade View      | 4205 - 268th Ave NE | Unincorporated King Co. |
| Cascade View      | 4707 - 272nd Ave NE | Unincorporated King Co. |
| Cascade View      | 26030 NE 40th St    | Unincorporated King Co. |
| Cascade View      | 27106 NE 40th St    | Unincorporated King Co. |
| Cascade View      | 27120 NE 45th St    | Unincorporated King Co. |
| Cascade View      | 24900 NE 52nd PI    | Unincorporated King Co. |
| Cascade View      | 25508 NE 62nd St    | Unincorporated King Co. |

## 6.5 Emergency Response Program

An Emergency Response Plan, presented in Appendix U, Emergency Response Plan and Forms, was developed to guide the District through emergencies as they occur. The objective of the plan is to accomplish all that is reasonably practical to ensure the health and safety of the public and the health and safety of District employees in the field.

District personnel routinely update the procedures and guidelines included in the Emergency Response Plan due to the ongoing changes that are occurring in the organization and in the water and sewer systems. These changes result from the continuing expansion of the organization and the systems, the acquisition of newer and better safety equipment, and the adoption of more sophisticated procedures.

The Emergency Response Plan assumes that District staff are familiar with the following emergency response procedures, which are discussed on an ongoing basis in monthly Safety Staff Meetings and weekly Field meetings:

- Safe entry into and operating within confined spaces
- Response to fire
- Response to electrical hazards including faults, downed wires, or other hazards
- Response to flooding from pump station failures
- Response to flooding from water main breaks or sewage line breaks

To ensure the Emergency Response Plan works effectively, all employees are aware of the current plan; health and safety equipment for employees is located onsite and in service vehicles as required; and frequent training and exercises are scheduled to provide a level of confidence and competence in the Plan.

The Emergency Response Plan identifies three levels of severity of an emergency, as adopted by state, federal, and other governmental agencies, to provide a universal standard for determining how and when to activate an emergency response. The plan provides examples for each of the three levels (Level 1 – Minor Emergency; Level II – Major Emergency; and Level III – Catastrophic Emergency) and describes what affect they would have on the District’s water and sewer system

The Emergency Response Plan gives the General Manager the authority to direct emergency response operations for the District. These operations include the following:

- Declare emergency situation (determine the level of emergency as defined in the Emergency Response Plan).
- Initiate District response to a declaration from county, state, or federal agencies.
- Invoke mutual aid requests and service agreement requests.
- Respond to requests from other jurisdictions to invoke mutual aid response.

The Emergency Response Plan discusses in detail the Emergency Response Organization and the functions and responsibilities of key staff members. The District designated four areas of responsibility for the overall District operations along with the designated “command lead” as shown below:

- Overall emergency response commander – General Manager
- Office operations, staff, and visitors – Controller
- Field Operations – Team Leader
- Financial, accounting, and other vital records – Controller

Designees would be assigned as required to fill those key staff positions if the appropriate personnel are not available.

The Emergency Response Plan contains the following checklists to ensure a responsive and controlled environment during and after an emergency situation. Samples of these checklists are included in Appendix U:

- Command Checklist
- Communications Checklist
- Roll Call Checklist
- Roster/Assignment Form
- Safety Checklist
- Search and Rescue Checklist
- First Aid Checklist
- Public Information Checklist
- Recordkeeping Checklist

One area of the Emergency Response Plan is devoted to operational procedures both during and after working hours. It lists what responses are required by the office and the field, damage assessment and isolation priority lists, and short-term restoration suggestions. A Water Facility Inspection Form and a Sewer Facility Inspection Form are included to document the amount of damage experienced by both the water and sewer facilities.

Specific emergencies and how they might affect the District's water and sewer facilities are discussed. A map illustrating the location of the different facilities as well as a chart showing the different pressure zones with the location of the PRVs, pumps, interties, and closed valves are included. Notes taken during the Inauguration Day Storm of January 20, 1993, list some of the problems that the District experienced and that have been corrected.

From the experience of the Inaugural Day Storm, additional generators, trucks, tools, and equipment were purchased and accommodations for District personnel were made.

The Emergency Response Plan has one section devoted to telephone numbers. These include employee telephone numbers and emergency contact numbers for each employee, as well as telephone numbers for the local fire districts, state and federal agencies, cities and special districts, utility companies, consultants, contractors and suppliers. The District is also a member of a mutual aid agreement that includes 28 water and sewer districts in Western Washington.

Included as a part of the plan are the locations of generators that can be used to restore power at the water and sewer facilities, as well as those that can be transported to the sites that do not have built-in generators. The headquarters office is wired to an emergency generator that will provide power if there is an outage.

If it becomes apparent that District customers must take action to protect their health from the water supply, Water Quality Notices are included as well as the telephone numbers of the communication industry to help publicize the public notices.

Also available at the radio communications sites located in the office is an Interagency Regulatory Analysis Committee Contact Directory should it become necessary for the District to request the assistance of the different agencies and cities included in the Directory.

For the comfort of employees who will be involved in an emergency situation, menus have been prepared and food and supplies have been stored.

The District endeavors to make the Emergency Response Plan user friendly. It is hoped that continually improving the contents within the plan will minimize interruption in water and sewer service during an emergency situation.

## 6.6 Safety Procedures

Written plans are located in the Safety Manual and Confined Space Manual, both presented in Appendix V. Table 6-11 lists the workplace hazards and Table 6-12 lists the safety measures the District uses to prepare its staff for workplace hazards.

**TABLE 6-11**  
Workplace Hazards

| Type of Hazard                   | Location of Hazard   |
|----------------------------------|--|
| Chemical                         | Sodium Hydroxide (NaOH, caustic soda, maximum 50% concentration): Wells 1, 9, 10<br>Sodium Hypochlorite (NaOCl, chlorine, 3-12% concentration): Well 4, Well 11.1, Well 11.2<br>Miscellaneous chemicals for water analysis, cleaning, etc. |
| Confined Space – Fall Protection | Manholes<br>Wet and Dry Wells<br>43rd Booster Pump Station<br>Metro, PRV, and Meter Vaults<br>Tanks  |
| Electrical – Lockout/Tagout      | Pumps<br>Generators<br>Control Panels<br>High-Pressure Fluids<br>Compressors<br>Hot Water Tanks<br>Heavy Equipment – Backhoes, Dump Trucks, Jet & Vac Truck, Forklift  |

**TABLE 6-12**  
Safety Programs

| <b>Safety Measures</b>                                     | <b>District Safety Programs</b>  |
|--|--|
| Certifications and Training                                | First Aid/CPR<br>Flagging and Traffic Control<br>Confined Space<br>Lockout/Tagout – Electrical<br>Bloodborne Pathogens<br>AC Pipe Work Practices<br>Hearing (Tests)<br>Safety/Staff Meetings<br>Safety Committee Meetings<br>Crew Meetings   |
| Safety Equipment   | Personal Protective Equipment (PPE) – Hard hats, vests, glasses, goggles, face shields, earmuffs, half-mask respirators, chain saw chaps, gloves<br>Safety Davit<br>Eye Wash Stations – Shop, Wells 4, 9, 10, S-10A Lift Station, Camden Park Lift Station, Inglewood Lift Station<br>Fall Protection – Harnesses, lifelines, lanyards<br>Gas Detectors (3)<br>First Aid Kits – All vehicles, shop, lunch room, Wells 1, 9, 10<br>Fire Extinguishers – All Vehicles and District Facilities<br>Bloodborne Pathogen Kits – Lunchroom and Unit 18<br>Booms, slings, and straps<br>Forklift |
| Maintenance, Calibration, and Certifications for Equipment | Safety Davit – Lifelines – Annually<br>Gas Detectors (3) – Monthly<br>Fire Extinguishers – Annually<br>Eye Wash Fluid – Biannually<br>Frequent inspections of equipment and supplies (i.e., first aid kits, bloodborne pathogen kits, PPE, straps) – Biannually to per use   |
| Safety Programs  | Safety Responsibilities<br>Organizing Safety Meetings<br>Accident Investigations<br>Automobile Fleet Safety Program<br>Traffic Control Program<br>Respiratory Protection<br>Fire Protection<br>Employee Safety Orientation<br>Chlorine Safety<br>Trenching and Shoring<br>First Aid Kits<br>Personal Protective Equipment<br>Bloodborne Pathogens<br>Confined Space<br>Asbestos Cement<br>Reporting and Recordkeeping – SARA Title III<br>Safety Drills<br>Vehicular Safety  |

\* Refer to the Safety Manual and Confined Space Manual for more detailed information (see Appendix V).

## 6.7 Cross-Connection Control Program

The following plan lays out the Cross-Connection Control Program (see Appendix J), as required by District Resolution 1327 (see Appendix E). The program outlines the minimum operating policies and backflow prevention assembly, installation, and testing practices and procedures. The program's organization is strictly in accordance with the WAC 246-290-490, but it is structured so that it can be supplemented with other published documents as well as with materials developed specifically by the District for District use. Initially, the program is organized to target the higher cross-connection risk customer class (nonresidential). As the program becomes established, the scope will increase to cover all customer classes.

The Cross-Connection Control Program consists of the following 11 elements:

1. **Purpose.** As mandated by the DOH, all Group A Water Systems are required to develop a cross-connection control program. The purpose of this program is to protect the health of water consumers and the sources of the public water system.
2. **Responsibilities.** This section clearly defines the responsibilities of the District and its customers. The District is responsible for inspections, regulation interpretation and guidance, records, and customer inquiry response. The water customer is responsible for control or elimination of cross connections directly affecting their property, providing records to the District, and the costs of inspections, testing, repairs, and/or replacement of backflow prevention assemblies.
3. **Applicability of Regulations and References.** There are numerous state and local regulations that directly or indirectly relate to cross-connection control. Approval of this Water Comprehensive Plan, and thereby this section, adopts the most current regulations as the standards for cross-connection control within the District. Where applicable, certain regulations are subject to the interpretation and discretion of the District. There are also various policies and procedures, developed by professional organizations that provide methods and guidance for operation, installation, and inspection. District cross-connection specialists are familiar with the *Accepted Procedure and Practice in Cross-Connection Control Manual* (Pacific Northwest Section, AWWA), *Manual of Cross-Connection Control* (Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California), and *M-14* (AWWA). The most current versions of these guidebooks, presented in this section, are also adopted on approval of this Water Comprehensive Plan. Where applicable, these references are subject to the interpretation and discretion of the District.
4. **Operating Procedures.** This section outlines the type and location of protection assemblies that should be used based on the degree of hazard of the connection. It also outlines the two types of cross-connection control defined by the WAC 246-290-101: (1) premise isolation, in which an air gap or backflow prevention device is installed at or near the connection, and (2) in-premise isolation, in which an air gap or backflow prevention device is installed within a privately owned property or as a plumbing fixture. Because devices used for premise isolation are more accessible for inspections, the District recommends this method, but both methods may be used.

5. **Installation Procedures.** The *Accepted Procedure and Practice in Cross-Connection Control Manual* (Pacific Northwest Section, AWWA) provides generally accepted methods for installation of backflow prevention assemblies.
6. **Inspection and Testing Procedures.** The *Accepted Procedure and Practice in Cross-Connection Control Manual* (Pacific Northwest Section, American Water Works Association) provides generally accepted methods for inspection and testing of backflow prevention devices.
7. **Backflow Incident Response Procedures.** Backflow incidents are usually detected by customers. All incidents will be reported and documented on a form acceptable to the DOH, as delineated in the WAC. All backflow incident reports will be documented in the annual Cross-Connection Control Program summary report.
8. **Quality Control Program.** The Quality Control Program outlines the minimum requirements for the District to maintain quality control for the cross-connection control program. The tester/inspector and their equipment should be certified and have their certification on record at the District. A test report submittal schedule is also provided in this section.
9. **Records.** The WAC 246-290-490 describes the minimum records that the water purveyors should maintain. This section lists the records the District should keep for all cross connections within its water system. Record maintenance is highly dependent on customer involvement, and a sample test report, to be used after installation, repair, and for annual inspection, is provided as an attachment.
10. **Public Education Program.** The District is responsible for educating its customers about their cross-connection program and backflow prevention. This section outlines public education programs to accomplish this task. A sample notification letter is provided as an attachment.
11. **Improvements Program.** The final section provides guidance for present and future operations. To meet existing and future cross-connection needs, this section states the tasks the District should undertake to comply with this cross-connection control program. Table 6-13 provides an estimate of the staff time required to execute this program.

The complete Cross-Connection Control Program is presented in Appendix J.

**TABLE 6-13**  
Estimated Staff Time Required to Implement Cross-Connection Control Program

| <b>Activity</b>  | <b>Description</b>   | <b>Annual Staff Hours</b> | <b>Equivalent FTE</b> |
|--|--|---------------------------|-----------------------|
| Inspect new connections  | 3 hrs/connection x 85 nonresidential connections/year (estimated)  | 255                       | 0.13                  |
| Inspect and test existing connections (residential, nonresidential, and irrigation)                    | Performed by outside testers   | 0                         | 0.0                   |
| Incident response (including travel)   | 8 hrs/response x 12 incidents/year (assumed)   | 96                        | 0.05                  |
| Program administration (includes public education, program guidance, plan review, recordkeeping, etc.) | 1 hr/connection x 1,000 existing connections w/ cross-connection control devices (estimated will increase as connections increase) | 1,000                     | 0.50                  |
| <b>Totals</b>  |  | <b>1,351</b>              | <b>0.68</b>           |

## 6.8 Customer Complaint Response

Customer complaints are received by customer service representatives in the Customer Service Department. The nature of the complaint (e.g., cloudy water, bad taste or odor, low water pressure, water leak, billing question) is electronically recorded in the District's computer system. The customer's name, address, telephone number(s), account number, and the best time to meet with the customer to discuss the problem are also recorded. A service order is generated and a customer service representative contacts the customer to try to resolve the problem, usually within 1 hour after the complaint is received. The resolution of the problem is recorded electronically, and the completed service order is filed.

Complaints that relate to water quality or leakage can be plotted using the District's Geographic Information System (GIS) to determine if the problem is especially common in a specific portion of the District.

During regular meter reading activities, if the customer service representatives notice a slow meter spin or high usage when compared with the previous meter reading, they leave a notice and leak detection information at the customer's residence to alert them to the possibility of a leak.

The number of customer complaints, by type, for 1999 are shown in Table 6-14.

**TABLE 6-14**  
Customer Complaints

| Type of Complaint             | Number of Complaints Received in 1999 | Typical Resolution of Complaint   |
|-------------------------------|---------------------------------------|---|
| Cloudy/dirty water            | 15                                    | Flushed water main<br>Flushed customer's service line<br>Installed air vacuum release valve on main<br>Bacteriological analysis   |
| Taste and/or odor or staining | 49                                    | Sampled main for bacteria<br>Customer flushed hot water tank<br>Customer replaced faucet service line   |
| Water pressure                | 84                                    | Tested pressure in watermain and at customer's hose bibb<br>Suggested in-line booster pump if customer desires pressure greater than 35 psi<br>Replaced check valve on setter   |
| Water leak/billing seems high | 387                                   | Repaired leak if on District side of meter, notified customer if on customer's side<br>Determined was groundwater, not leaking main or service<br>Adjustments to bill when leak fixed<br>Scheduled payments for large bills |

## 6.9 Recordkeeping

In accordance with WAC 246-290-480, the District maintains records of its operations and water quality analyses. A summary of the types of information kept and the length of time these records are retained is presented in Table 6-15.

The bacteriological and chemical analyses results, the daily source meter readings, actions taken to correct violations, and information regarding sanitary surveys are filed by the Water Crew's administrative assistant. The chemical analysis results for all the District's wells are compiled in a table that is provided to the District's customers on request. This information is also used to prepare the annual Consumer Confidence Report. The source meter readings, together with readings from the intertie meters and booster pump stations, are provided to the General Manager for use in managing and evaluating the operation of the water system.

**TABLE 6-15**  
Recordkeeping

| Type of Record  | Retention Period                        |
|---|---|
| Bacteriological sample results  | 5 years                                 |
| Chemical analysis results, including lead and copper sampling results   | As long as water system is in operation |
| Daily source meter readings   | 10 years                                |
| Other records of operation and analyses as may be required by DOH   | 3 years                                 |
| Records of action taken by the system to correct violations of primary drinking water standards, including copies of public notifications | 3 years after last corrective action    |
| Written reports, summaries, or communications relating to sanitary surveys  | 10 years                                |
| Project reports, construction documents, and related drawings, inspection reports and approvals   | Life of the facility                    |

\* See Table 6-5 for a detailed description of tasks for the Conveyance, Wells, Booster Pump Station, and Reservoirs.

Project reports, construction documents and drawings, inspection reports, and project approvals are maintained by the Engineering Department in project files, which are stored in the archive room. Paper copies of as-built drawings and the original Mylar as-built drawings are stored in the map room for use in locating existing facilities and for design of future extensions. When construction is complete, as-built drawings are prepared and input into the District's GIS.

Operations and maintenance manuals for the District's booster pump stations, emergency generators, and corrosion-control facilities are stored in the District's library and at each facility.

Copies of reports such as the Comprehensive Water Plan, Wellhead Protection Program, water supply evaluations, neighboring water system comprehensive plans, and other governmental agencies' comprehensive planning documents are stored in the District's library.

The District is embarking on a program to electronically store and retrieve all project-related information. The objective is to make all information relating to a facility easily retrievable using the District's computer system. The information is scanned, its accuracy and completeness are verified, and it is indexed by project or facility.

## 6.10 Reporting

The District is required to report to DOH within 48 hours if the District fails to comply with primary water quality standards, fails to comply with monitoring requirements, or if there is a violation of the primary maximum contaminant level (MCL). Monthly reports are submitted to DOH by the tenth day of the following month and water facility inventory (WFI) forms are submitted annually. In addition, updated WFI forms must be submitted

within 30 days of any change in name, category, ownership, or responsibility for management of the water system, or any addition of source or storage facilities. Daily source meter readings and annual water production records for each source must be made available to DOH on request. Results of monitoring for unregulated volatile organic compounds (VOCs) will be sent to DOH within 30 days of receipt of the analytical results.

Special reporting requirements apply to bacteriological samples. The District will notify DOH:

- Within 10 days of notification by the laboratory if coliform is found in a sample
- By the end of the business day in which notification is received from the laboratory that fecal coliform or *Escherichia coli* (*E. coli*) is found in a sample
- Within 24 hours of determining acute coliform MCL violations (fecal coliform or *E. coli* present in repeat sample)
- By the end of the next business day of determining a nonacute coliform MCL violation (i.e., more than 5 percent of samples show presence of coliform)

Public notification of an MCL violation, monitoring requirements, analytical requirements, or a DOH order will be in accordance with WAC 246-290-495.

## 6.11 Operation and Maintenance Improvements

The introduction of new supplies and facilities into the District's water system will require some additional modifications and additions to the Operation and Maintenance Section of the Water Plan. The facilities and resultant operation and maintenance will vary depending on the water supply source, groundwater or regional water. Table 6-16 outlines the anticipated changes.

## 6.12 Water Shortage Response Plan

The District has prepared a Water Shortage Response Plan (WSRP) that will be used to reduce water demand through systematic responses during emergency, operational, and drought situations due to a water supply shortage. A complete copy of the WSRP is presented in Appendix U.

As stated in the WSRP, the District's objective is to establish actions and procedures for evaluating supply options and managing water demand during a water supply shortage. The District intends to maintain essential public health and safety and to minimize adverse effects to residents and businesses should a water shortage occur. The various approaches or strategies are tailored to specific water shortage events and are presented in four stages:

1. Advisory—District informs customers once data are available indicating that there might be a less-than-normal supply of water.
2. Voluntary—District relies on the voluntary cooperation and support of customers to meet water use reduction goals.

3. **Mandatory**—District requires customers to implement water-saving measures to meet the District’s reduced consumption goal.
4. **Rationing**—District requires extraordinary levels of reduction to ensure that demand does not exceed supply and that public health and safety are not compromised.

**TABLE 6-16**  
Operation and Maintenance for Capital Improvements

| Facility                             | Tasks   |
|--------------------------------------|---|
| <b>Groundwater</b>                   |   |
| Water Distribution System/Conveyance | Maintain additional 50,000 feet of piping.  |
| Sampling                             | Additional sampling to meet comprehensive monitoring requirements.  |
| Wells                                | Maintain new wells (to be constructed if new water rights are granted).   |
| Booster Pump Station                 | Maintain new booster pump stations.   |
| Reservoirs                           | Maintain new reservoirs.  |
| Treatment Systems                    | Maintain chlorine and manganese treatment at wells. Either one or a combination of these treatment processes will be required at all wells.   |
| Cross-Connection Control             | Maintain Cross-Connection Control Program in accordance with Resolution 1327 and this Plan.   |
| Administration                       | New activities will result in extra administrative work. Additional filing, recordkeeping, and customer contact is required. Maintain records for cross-connection control, treatment facilities, and water quality monitoring. |
| <b>Regional Surface Water</b>        |   |
| Water Distribution System/Conveyance | Maintain additional 50,000 feet of piping.  |
| Sampling                             | Additional sampling to meet comprehensive monitoring requirements. Introduction of regional water will require additional sampling where different waters are blended.  |
| Booster Pump Station                 | Maintain new booster pump stations.   |
| Reservoirs                           | Maintain new reservoirs.  |
| Treatment Systems                    | Maintain chlorine, manganese, and fluoride treatment at wells. One or a combination of these treatment processes will be required at all wells.   |
| Cross-Connection Control             | Maintain Cross-Connection Control Program in accordance with Resolution 1327 and this Plan.   |
| Administration                       | New activities will result in extra administrative work. Additional filing, recordkeeping, and customer contact is required. Maintain records for cross-connection control, treatment facilities, and water quality monitoring. |

\* See Table 6-5 for a detailed description of tasks for the conveyance, wells, booster pump station, and reservoirs.

Water supply shortages are categorized as:

- Emergencies—Caused by damage to major infrastructure that could affect water supply, storage, or distribution to customers' homes and businesses
- Droughts—Naturally occurring, but unpredictable, weather events of varying frequency, duration, and severity that could negatively affect the recharge of aquifers
- Operational Situations—Events in which a critical link in the District's system is not available for service

The WSRP stresses that there are differences between the District's long-term conservation program and the reduction of water use through short-term measures that might result in tradeoffs or hardships for customers. However, conservation methods may be promoted as part of the strategies used during a water supply shortage situation.