CHAPTER 6 – OPERATION AND MAINTENANCE PROGRAM

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CHAPTER 6

OPERATION AND MAINTENANCE PROGRAM

The following sections summarize the operation and maintenance procedures which assure satisfactory management of the water system operations in accordance with WAC 246-290. Ideally, operation and maintenance programs should be documented in standalone documents that clearly outline the day-to-day functions involved in keeping the water system running smoothly and within guidelines. This section is intended to summarize these stand-alone documents when available and provide direction when they are not.

6.1 DISTRICT MANAGEMENT AND PERSONNEL

King County Water District No. 49 is a special purpose district per RCW 57 which operates under the direction of a Board of Commissioners which has been elected by the voters in the District. There are three positions on the Board and each member is required to live within the boundary of the District. By resolutions, the Board makes and establishes policies that govern the operation of the District.

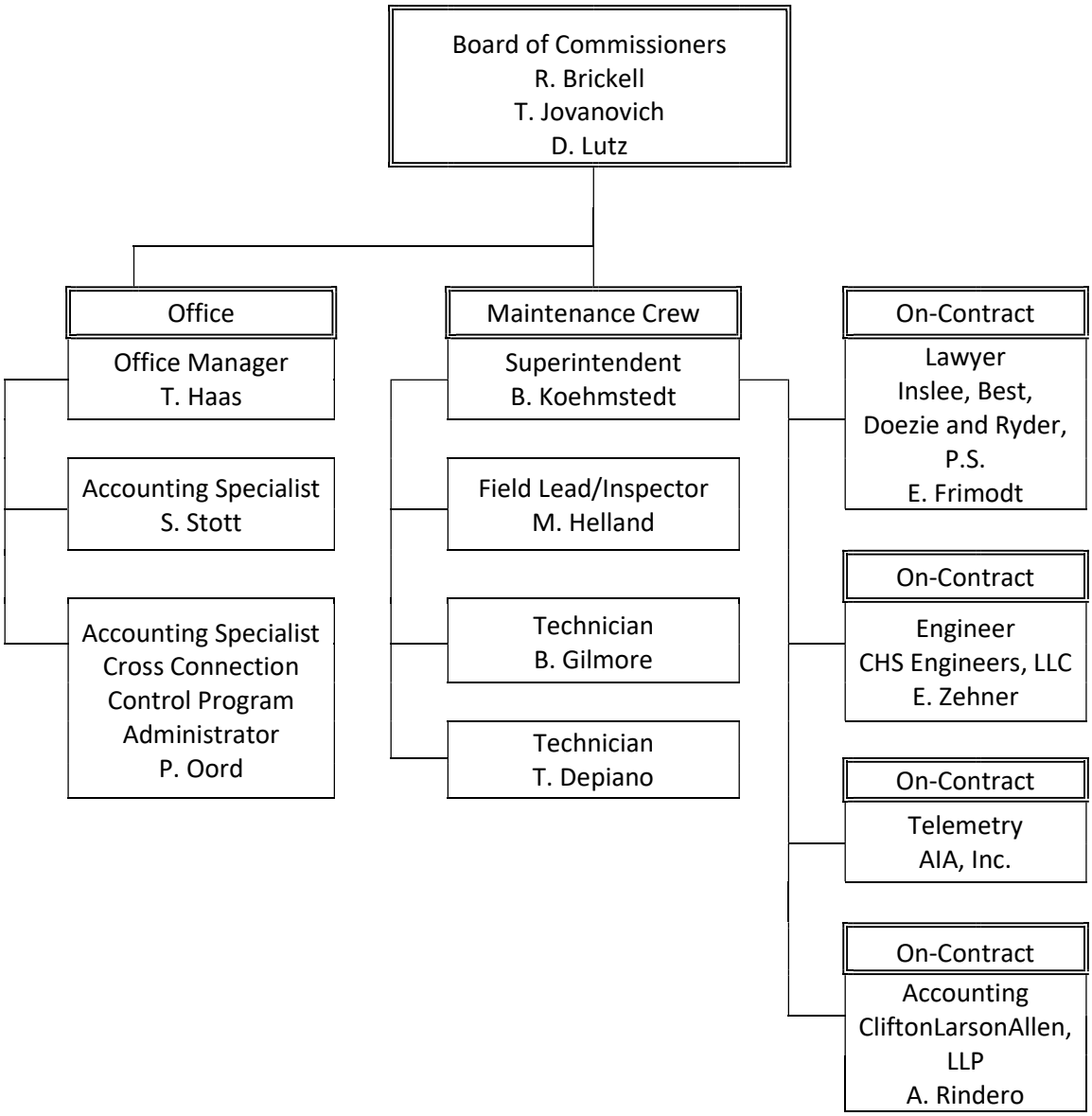
The District holds its regular public meetings on the second and fourth Wednesdays of each month. The District's business address and general information is presented below.

District Address and Phone Number:	King County Water District No. 49 415 SW 153rd Street Burien, WA 98166 206-242-8535
District Contact Person:	Bryan Koehmstedt, Superintendent
Dept. of Health Identification Number:	39800P
Dept. of Health Contact Person:	Richard Rodriguez, Regional Planner Brietta Carter, P.E., Regional Engineer Northwest Drinking Water Operations 20425 72nd Ave S, Building 2, Suite 310 Kent, WA 98032

The current Water District Superintendent is Mr. Bryan Koehmstedt who is responsible for the day to day operations of the District. The current Water Office Manger is Mrs. Tammy Haas who is responsible for District finances and related tasks. Both report directly to the Board of Commissioners. There are five additional full time employees at the District; two work in the office and three work in the field. The Superintendent manages and delegates specific tasks to the three full time maintenance employees

and the Office Manager manages and delegates specific task to the two full time office employees (see Figure 6-1).

FIGURE 6-1
ORGANIZATIONAL CHART



Engineering, technical, financial and legal counsel for the District is provided by outside consultants approved by the Board of Commissioners. These consultants report to and coordinate with the District Superintendent and other staff as directed or required.

Administrative duties are divided between the three office employees who take care of customer relations, account information, billing and other general administrative duties.

Budgets are reviewed by the Board of Commissioners on an annual basis.

The duties of the field crew include, but are not limited to, the following:

- Inspection of major facilities including the reservoir and pump station.
- Investigation of complaints and reported problems.
- Locating water facilities as requested.
- Response to emergency situations in the appropriate manner.
- Repair of leaks and line breaks. Installation of new service connections, including road restoration.
- Reading of water service meters on a bi-monthly cycle.
- Lock and unlock meters.
- Investigating and resolving reported cross-connection problems.
- Inspection of construction projects which may affect the water system in any way.
- Traffic control in support of District activities.
- Maintenance of parts inventory required for repairs.
- Maintenance and repair of fire hydrants including painting and clearing around hydrants.
- Operation and repair of equipment including backhoe and dump truck.
- Flushing of dead end mains.
- Working with other utilities and agencies for coordinated efforts on construction projects or to provide mutual aid to other districts.
- Water sampling and testing
- Meter replacement.

6.2 PERSONNEL CERTIFICATION

The District encourages state certification of operations personnel and sponsors attendance of personnel at safety and technical seminars. Table 6.1 provides a listing of current certifications held by District staff members. District staff rotates “on call” duty to ensure that a qualified staff member is available for District needs 24 hours per day.

TABLE 6.1
CURRENT EMPLOYEE CERTIFICATIONS

Employee	Job Title	Certification Level
Bryan Koehmstedt	Superintendent	Water Distribution Manager 3 Water Distribution Specialist Cross Connection Control Specialist
Mike Helland	Field Lead/Inspector	Water Distribution Manager 3 Water Distribution Specialist Cross Connection Control Specialist
Brian Gilmore	Maintenance Technician	Water Distribution Specialist Cross Connection Control Specialist
Tony Depiano	Maintenance Technician	Water Distribution Manager 3 Water Distribution Specialist Cross Connection Control Specialist

6.3 WATER QUALITY MONITORING

Water quality sampling and monitoring for the District is performed by SPU and submitted to DOH on behalf of the District. SPU collects water samples at eight sampling stations located within the boundaries of the District. In the event a positive bacteriological sample is discovered, the District is notified by SPU to take repeat samples at the predetermined locations as determined by the District's Coliform Monitoring Plan and SPUs 2011 Comprehensive Drinking Water Quality Monitoring Plan. The District's Coliform Monitoring Plan was adopted concurrent with the 2008 WSP and an updated version is included in Appendix J. All water sampling is performed in accordance with Chapter 246-290-300 WAC. The District recently completed installation of an automated continuous chlorine analyzer to facilitate daily monitoring of chlorine residual in the distribution system.

Water supplied by SPU to the District comes almost exclusively from the Cedar River watershed. Because the water from the Cedar River is unfiltered, SPU follows disinfection and monitoring requirements under WAC 246-290-692 and 246-290-694, sampling somewhere in the SPU distribution system at least once per day throughout the year.

In accordance with the requirements of the United States Environmental Protection Agency (USEPA), the District has developed and implemented a Disinfection Byproducts Rule Plan (DBP) to monitor the levels of the byproducts of the water disinfection process. Two water samples are taken by District staff at eight locations once every two months. The samples were analyzed to determine the levels of total trihalomethanes (TTHM) and five haloacetic acids (HAA5) in the distribution system. The final Individual Distribution System Evaluation report has been submitted to and

approved by the USEPA. IDSE Monitoring Plan approval letter and IDSE Standard Monitoring Report approval letter from the USEPA are included in Appendix C. Stage 2 DBP monitoring is ongoing. The District collects samples at four locations each quarter and SPU completes the analysis and reporting on behalf of the District.

6.4 EMERGENCY RESPONSE PROGRAM

The District's Emergency Response Plan (ERP) identifies the notification procedures in the event of an emergency. In response to the events of 9/11/01, the Federal government has enacted the Public Health Security and Bio-Terrorism Preparedness and Response Act (HR 3448) requiring preparation of vulnerability assessments and preparation or update of ERP's for public water systems serving populations greater than 3,300 people. The District prepared a vulnerability analysis and emergency response plan which were submitted to the EPA in 2004. The District's ERP was updated in July 2008 and adopted by Resolution 08-1218. A copy of the District's Emergency Management Plan is included in Appendix K.

The District is a member of WAWARN, a statewide municipal mutual aid organization.

The District maintains a detailed list of contacts for all District personnel and commissioners. That list is updated periodically and distributed to all staff. Key contacts are included in the ERP and are summarized in Table 6.2.

TABLE 6.2
EMERGENCY CONTACTS

Contact	Telephone No.
Emergency	911
Water District No. 49	206-242-8535 (answering service after hours)
Bryan Koehmstedt, Superintendent/Field Lead	206-735-0842
SPU	206-386-1818
Department of Health (Kent)	253-395-6750 or 877-481-4901
T.V. Stations KIRO KOMO KING	 206-728-7777 888-477-5666 206-448-5555
Radio Station (KVI)	206-404-4000
Radio Station (KOMO)	206-404-5666
Radio Station (KIRO)	206-426-7000
Radio Station (KMPS)	206-805-0941
King County Emergency Mgmt.	206-296-3830
King County Fire District No. 2	206-242-2040

During Office Hours	Contact the Superintendent or office personnel **Phone: 206-242-8535**
After Office Hours	Calls to the District office are taken by an answering service who contacts the "on-call" person. Based on the severity of the problem, this person notifies the Field Lead who will notify the District Superintendent as necessary. **Phone: 206-242-8535**

6.5 WATER SHORTAGE RESPONSE PLAN

The District updated its Water Shortage Response Plan in 2008. The Plan aims to reduce customer demands in response to a water supply emergency or in a drought event. The plan is designed to be used in highly unusual or infrequent events. It is divided into four stages to be implemented immediately for severe restrictions (in the event of a water main break or failure) or to progressively implement more severe demand reductions as part of a regional effort. The stages are:

- Advisory
- Voluntary
- Mandatory
- Rationing

The District's Water Shortage Response Plan has been updated to capture general changes since adoption in 2008. The update was adopted concurrent with the 2017 WSP and is included in Appendix M.

The District's 2017 Water Shortage Response Plan should be reviewed for consistency with the SPU 2018 Water Shortage Contingency Plan, then updated appropriately.

6.6 CROSS-CONNECTION CONTROL PROGRAM

Washington State regulations place the primary responsibility for control of cross-connections with the water purveyor. In 2005, the District adopted Resolution 05-1196 as the Policy relating to cross-connection control and backflow prevention. This set of policies establishes cross-connection control requirements in accordance with Chapter 246-290-490 WAC. All District field operations staff are certified as cross-connection control specialists. A copy of the Cross Connection Control Plan is included as Appendix B. Concurrent with adoption of this Plan, the District will adopt an update to the Program to replace Exhibit D, Backflow Incident Report Form with DOH Publication 331-457 for incident reporting.

As of 2018, the system included 34 "Table 9" hazards. All have an approved backflow prevention assembly, and all have been tested in the last year.

6.7 SYSTEM OPERATION AND CONTROL

District personnel perform routine inspections and repairs to the system based on individual policies and District Standards which are further outlined in Chapter 7. Preventative maintenance programs are limited to field maintenance activities which take place at regular intervals.

The following is a description of the major system components including basic operation and maintenance procedures.

6.7.1 System Components

The major system components of King County Water District No. 49 are shown in Figures 3-1 and 3-2.

6.7.2 Routine System Operation and Maintenance

Seattle Public Utilities Connection Points

Each of the five stations includes a master meter and are inspected monthly to verify security and proper operations of the facility. Confirmation of operation is verified by visual inspection of connection point and checking of electrical controls where applicable.

Intertie Connection Points

Each intertie with adjacent purveyors is inspected monthly to verify security and proper operations of the facility. Confirmation of open/closed status is verified by visual inspection of the applicable valves. Interties with flow meters are inspected every month to record the usage through the connection for billing purposes.

Concrete Reservoir

District personnel conduct a visual inspection of the reservoir on a weekly basis. The integrity of the reservoir vent, hatch and screens is confirmed by inspection annually, at a minimum. The reservoir is observed for signs of leakage or corrosion. The interior of the concrete reservoir is visually inspected and cleaned on a three year cycle. The hatch and interior ladder is secured.

Reservoir Distribution Pump Station

The pump station is checked weekly to verify site conditions, security and the proper operation of all equipment and controls. Landscape is maintained at least once or twice per month.

Distribution System

The District maintains an inventory of pipe, miscellaneous fittings, repair couplings, hydrants, hydrant repair kits and other system related components. District staff perform all emergency pipeline repairs and system work including service taps up to 2-inch. The inventory of items is done each quarter and restocked as needed.

Dead-end mains are flushed once a year to provide necessary cleaning of these potential water quality problem areas. Additional flushing occurs in response to customer complaints or pipeline repairs that necessitate the flushing of lines.

Isolation Valves

The water system's isolation valves are exercised annually. Valve covers are inspected for damage and replaced as necessary.

Service Meters

District personnel install all service meters. Service meters are replaced on a twenty year cycle. Meters that are not operating or not operating satisfactorily are identified by the meter readers and replaced as necessary. Meter usage data is analyzed in an effort to determine faulty meters. Records for each meter including location, meter number and installation date are kept in a database at the District. The District has installed some remote read meters in areas that are of safety and/or traffic concern to meter reading personal.

Fire Hydrants

Fire hydrants are inspected and painted as required on an annual basis by the District. Proper operation of the main valve is checked and the valve is exercised. Hose and pumper threads are checked for damage as well as conformity to local fire department requirements. Caps are checked for damage and ease of removal. Cap gaskets are checked and replaced as necessary. Fire hydrant access is cleared of obstructions. Any identified hydrant deficiencies are addressed as soon as possible.

Telemetry System

Operation of the telemetry system is checked daily. If problems with the system occur or if the system requires modifications or upgrading, the District engages an information technician subconsultant.

6.7.3 Preventative Maintenance Program

Preventative maintenance actions are either performed by District personnel or contracted out to certified professionals. The preventative maintenance actions which are routinely performed are presented below including the frequency of occurrence.

- Maintenance of pressure reducing valve stations
  - Valve cleaning every year
  - Valve rebuilding every five years

- Cleaning of reservoir
  - Interior cleaning every three to five years

- Exercising of system valves
  - Inspection and exercising every year

6.7.4 Equipment and Supplies

As stated in the previous section, the District maintains an inventory of repair parts and couplings for pipe sizes ranging from ¾-inch to 12-inch. Parts needed for repairs or minor improvements are replenished each quarter during the inventory check. The District maintains an inventory of ¾ through 4-inch service meters as well as meter setters.

6.8 SAFETY PROCEDURES

District personnel are frequently involved in water main repair and replacement projects that expose them to heavy construction activities, excavations and in many cases vehicle traffic. Safety procedures that are followed for each potential work place hazard are routinely discussed at monthly safety meetings. In addition to conducting the monthly meetings, the safety officer maintains all safety procedures and records which are on file at the District.

6.9 CUSTOMER COMPLAINTS RESPONSE PROGRAM

The District maintains a record of complaints by making notations on the computerized billing system. In addition, complaints which are filed by customers who attend board meetings are logged in the minutes of the meeting.

Complaints are responded to appropriately by District staff who determines if the issue can easily be resolved or if the creation of a service order is necessary. If a service order is issued it lists the nature of the complaint. The service order is closed out upon satisfactory completion of any required work and the recording of the corrective action taken.

Multiple complaints which arise from maintenance activities (such as dirty water complaints which often come after water is flushed through hydrants) are not individually documented.

6.10 RECORDS AND REPORTS

The District's administrative staff shares in the responsibility of maintaining all records pertaining to water use, billings, receipts and water utility financial records. In addition, the staff also maintains records regarding the system facilities, utility locate requests, repairs, and water quality monitoring and reporting.

Construction Completion Reports for all distribution main replacements and extensions are completed and filed with the respective project file.

6.11 OPERATIONS AND MAINTENANCE IMPROVEMENTS

The following is a summary of the recommended improvements related to operations and maintenance.

- In response to updates to the DOH guidance publication for preparation of a Coliform Monitoring Plan, WAC 246-290-300 and recent correspondence from DOH, the number of sample stations should be increased from four to eight. The additional stations were installed early in 2016. The additional locations are:
    - 313 S. 150th St.
    - 15402 22nd Ave. SW
    - 2640 SW 164th Pl.
    - 843 S. 177th Pl.
- In response to recent water quality and sampling situations in the region, the District should consider upgrades to allow repeat sampling at specific sample station facilities rather than hose bibs at customer residences. With a future total of eight primary sample sites, a total of 16 meter setter style sample facilities would be needed.
- In response to recent water quality and sampling situations in the region, DOH recommends review and update of sample collection standard operating procedures.
- As documented in the March 2015 Routine Sanitary Survey report by DOH, the number of monthly samples taken in the District will be increased to the number required by WAC 246-290-300 immediately. This has been implemented by SPU.
- DOH recommends completion of an E. coli response plan and consideration of means to quickly boost disinfection at the SPU supply stations or District reservoir, in an emergency water quality situation.
- DOH recommends regular monitoring and documentation of chlorine residual, pH, conductivity and heterotrophic plate counts (HPC) as background baseline data, for reference and indication of distribution system water quality. The District has already begun weekly collection of chlorine residual data and SPU provides HPC if analyzed.
- District staff recommends consideration of addition of variable frequency drives and a natural-gas powered standby power generator at the existing reservoir

booster pump station. These considerations should be made in the context of additional storage capacity and related pump facilities.

- The District's 2017 Water Shortage Response Plan should be reviewed for consistency with the SPU 2018 Water Shortage Contingency Plan, then updated appropriately.
- Existing D of the Cross Connection Control Program (Appendix B) should be replaced with DOH Form 331-457 for incident reporting. That form is included in Appendix B and that change will be adopted concurrent with approval of this Plan.
- DOH conducted a sanitary survey in March 2015. In response to that survey a tap has been added at the outlet of the existing reservoir for collection of a water sample for coliform bacteria testing. A continuous chlorine analyzer was added at the outlet of the existing reservoir for automated residual monitoring. DOH indicated that appurtenances to provide additional disinfection to the system in an emergency are recommended, at a minimum. The District intents to utilize the existing and planned reservoir for such purposes.

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