

SYSTEM INSPECTION / MEETING SUMMARY

Date: March 12, 2013

WESTSIDE WATER ASSOCIATION - King County (ID# 949500)

Persons Attending:

Denny Conner, Pat Call, Doug Dolstad – Westside Water Association
Paige Igoe - Washington State Department of Health

Purpose: Routine Sanitary Survey

BOLD TYPE INDICATES ITEMS NEEDING ATTENTION (SEE SUMMARY PROVIDED AT END OF REPORT)

WATER FACILITIES INVENTORY:

Group A Community System

Existing Connects = 225 Total (220 single family residential and 5 non-residential)
per WFI; **system reports 232 existing connections**

Population = 520

Engineering Capacity = 227 connections

LAST SANITARY SURVEY:

The last sanitary survey was conducted by Washington State Department of Health (the Department) staff on November 20, 2008. The following recommendations were made:

- Clean up Canyon Well/Pump House site of any appurtenances not being used. *Status: Complete.*
- Routinely inspect spring collection points, which may require building better access or walkways. *Status: Not complete.*
- Submit construction completion report (CCR) to receive final approval of Well 4 (referring to Canyon Well). *Status: Not Complete.*
- Start utilizing new monitoring form for monthly reporting. *Status: Complete.*
- Update commercial connections on WFI form. *Status: Complete.*
- Collect and report quarterly compliance samples for arsenic when the Canyon Well is in use. *Status: Complete.*
- Seal openings in the hatch areas of the 15,000 gallon fiberglass tank. *Status: Complete.*
- Add neoprene seal to 153,000 gallon Green Tank access hatch. *Status: Not Complete.*
- Conduct routine inspection of reservoir hatch, vent and overflow screens at least twice per year. *Status: Ongoing.*

SYSTEM OVERVIEW:

Water association located just northwest of downtown Vashon in unincorporated King County. The Westside Water Association (Westside) water system serves customers in two pressure zones, supplied by one spring, 9 driven well points and the Canyon Well, two storage reservoirs, and two small booster pump stations. The Canyon Well, which contains arsenic, is currently used in the summer to help meet peak demands. Disinfection is provided; 4-log inactivation achieved in transmission line to 153,000 gallon Green Tank. The system is currently in the process of completing a project to blend Canyon Well water with the spring and driven well point sources; and a full scale pilot to provide coagulation/filtration treatment for removal of arsenic. All of the facilities were visited during the site visit; please see photos attached at the end of this report.

SOURCES AND INTERTIES:

Currently, Westside receives its water from Sand Spring (S01), nine driven well points (S03) and the Canyon Well (S06) which are all located in the same place known as the Canyon; Shinglemill Creek runs through it.

Sand Spring (S01): This spring currently consists of a perforated pipe driven into the sandbank on hillside; collect water from Needle Creek upslope from Shinglemill Creek. A landslide occurred reportedly in February 2001, covering the origin or intake of the spring. Gravity flow in 4-inch line to 15,000 gallon fiberglass tank at the Canyon Pumphouse.

Driven Well Points (S03): Nine driven wellpoints are considered a wellfield (S03). Each driven well point consists of steel pipe with three foot of screen driven into hillside; 1¼-inch or 1½-inch pipe diameter; approximately 20 feet deep. A 4-inch casing was driven surrounding the steel pipe; backfilled with bentonite; extend of 'seal' unknown. HDPE piping installed since last survey conveying driven well point water over Shinglemill Creek. Transmission of water is conveyed through a series of PVC pipes located above ground. Water from the driven well points is manifolded into a 2-inch PVC and a 4-inch PVC pipe, flowing by gravity into the 15,000 gallon fiberglass tank located underground at the Canyon Pumphouse. The wellpoints likely rely on a siphon for water to flow, which means part of the collection piping is at very low or negative pressure. **It is important to conduct regular inspection and maintenance of the well points and transmission lines; access may need to be improved to do this.** Previous surveys have reported storage reservoirs located along the transmission lines, all of which have been removed. The operator reports diminished flow from the wellpoints. **If changes are made to the transmission system or a reservoir is added, a project report detailing the changes must be submitted to the Department for review and approval.**

Canyon Well (AHM851) (S06): The well was constructed in 2003; 290 feet to first open interval (300 feet depth of completed well). Capacity listed on WFI as 10 gpm; operator reports capacity at 65 gpm (confirmed with pump test). Surface seal 22 feet (bentonite). Screened vent at wellhead; source meter and raw water sample tap located at pump house. Well is controlled on/off by water level in 153,000 gallon Green Tank.

Other/Historical Sources: The system has historically used Jack Spring (S02), which was recently reconstructed (not in accordance with the approved design) and according to MPA testing, is considered groundwater under the influence of surface water (GWI). Jack Spring is currently designated as an emergency source on the WFI. Shinglemill Creek/Spring (S04) is also not currently in use; designated as an emergency source. Other spring sources (some with associated piping that has been disconnected) are evident from a walk in the watershed are not currently in use.

Sanitary Control Area (SCA): The springs, Canyon Well and driven well point are all co-located on 40 acres of Westside-owned property, which runs along Shinglemill Creek. Watershed does not appear to be completely fenced; access is limited due to steep canyon, trees and wet ground.

Interties: The system does not currently have any interties with adjacent purveyors.

TREATMENT:

Currently, Westside provides disinfection for the Sand Spring and driven well point sources and for the Canyon Well when in use. The arsenic treatment installed in the mid 2000's failed and is not currently in use.

Disinfection: Water from Sand Spring and the driven well points flows by gravity to the 15,000 gallon fiberglass tank located underground at the Canyon Pumphouse facility. Water from the Canyon Well (when in use) is pumped through a dedicated line into the same fiberglass tank. Two 120 gpm (20hp) pumps are used to convey water from the 15,000 gallon fiberglass tank up to the 153,000 gallon Green Tank. A chlorine solution is currently introduced into the discharge side of the pumps. A solution tank is located outside of the pumphouse building; 12.5% sodium hypochlorite is used. The required disinfection time is achieved in the pipeline between the pumphouse and the Green Tank (approximately 2,700 LF of 4-inch pipe); minimum residual of 0.5 mg/L. Additional contact time is available in the Green Tank. The compliance point for residual sampling is located at the small booster pumphouse located at the Green Tank.

Once the blending project is completed, the injection points for chlorination will change. Chlorination will be introduced into the respective pipelines downstream of the Canyon Well and into the 2-inch line that conveys the Sand Spring and driven well point water prior to entry into the 15,000 gallon fiberglass tank. Each line will have its own source meter; Stenner chemical metering pumps will be used, flow paced to maintain residual.

Arsenic Treatment: The coagulation/filtration treatment system installed in the mid-2000's is still in place but not operating. Westside has submitted a revised design, utilizing some of the existing equipment, to treat Canyon Well water. The design was approved and Westside is planning on conducting a full scale pilot of the treatment system, hopefully in early 2013 so it can be online to meet peak summer demands. The treatment will use potassium permanganate as an oxidant, ferric chloride will be added to adsorb with arsenic and NaI Clear will be added as a secondary coagulant. The original design called for additional contact

vessels; however, it appears Westside is interested in utilizing a larger contact tank which would be located outside the pumphouse building. **Please direct your engineer to provide a detail describing the changes planned for the full-scale pilot test.** The existing filters and sand media will be tested and used if results are shown to be satisfactory. Backwash water will be directed to an on-site holding tank; backwash will be conducted once every 12 days when the system is not in use. For the full-scale pilot test, all water will be filtered to waste; the waste piping was observed during the survey. **Westside is responsible for providing data/information outlined in the November 2, 2012 email from your engineer (and our approval letter) to the Department for review. A construction completion report must be submitted and acknowledged by the Department prior to putting treated water into the distribution system.**

At the Canyon Pumphouse site, extraneous items have been cleaned up (in comparison to the March 2012 site visit) and a majority of the piping has been labeled.

STORAGE:

Two storage facilities serve the needs of the Westside system: the 153,000 gallon steel Green Tank which serves the lower or main pressure zone and the 100,000 gallon Mt Baker Silo (concrete) Cove Tank which serves the upper pressure zone.

The following observations were made at the 153,000 gallon Green Tank:

- Did not climb tank; see photos of the access hatch, vent, overflow and gauge board cable entry provided by operator after the survey.
- Tank has nominal volume of 156,000 gallons; operate at 153,000 gallons.
- Adequate turnover; 6 foot operating band.
- Has two inlet pipes; recently added riser pipes to help improve water circulation.
- Exterior overflow; has flapper valve.
- Access hatch does not have a neoprene seal (as recommended in the 2009 survey). Operator says seal is tight.
- Located on customers property; not fenced.

The following observations were made at the 100,000 gallon Mt Baker Silo (concrete) storage reservoir (known as the Cove Tank):

- Did not climb tank; see photos of the access hatch, vent, overflow and gauge board cable entry provided by operator after the survey.
- Adequate turnover; 4 foot operating band.
- Exterior overflow; screened.
- Area not fenced, surrounded by trees; locked gate located at entrance road.

Operator visit tanks regularly; checks top of facilities at least once per year. Maintains brush around tank. **Consider cleaning interior of tanks; schedule to clean on a regular basis.**

DISTRIBUTION:

The existing distribution system is comprised of pipe ranging in diameter between 2-inch and 8-inch, comprised of various materials. The system has hydrants and blow-off assemblies in place on dead-end lines. Fire protection is provided; only 2 hydrants can provide 1,000 gpm for 2 hours; the remaining hydrants have less available fire flow. Fire Department is aware of limitations.

The distribution system is comprised of two pressure zones. Water is distributed from Canyon Pumphouse to the Green Tank through a dedicated line; gravity flow from the reservoir. The main zone is larger and feeds homes all the way to the water; PRVs installed at individual homes as necessary. A small booster pump (7hp, single phase) at the Green Tank pumps water to the Cove Tank; the Canyon Pumphouse pumps can provide water directly to the Cove Tank if necessary. The booster pump is located in a small wooden shed at the base of the Green Tank (next to shed that serves as an office for certified operator). A source meter here totalizes flow fed from the Green Tank to the Cove Tank; read daily. At the Cove Tank, another small pump (approximately 5 hp), provides water to customers in the upper pressure zone. System provides adequate pressure to customers, no complaints.

WATER QUALITY MONITORING:

A short summary of recent water quality sampling results and monitoring compliance is provided below. Water quality results entered into our Sentry data system can be reviewed at <http://www.doh.wa.gov/ehp/dw/sentry.htm>.

Distribution System Monitoring Requirements

Coliform Monitoring: Required to take 1 sample per month at representative locations in the distribution system. Last five years of coliform history is clean. Last positive coliform sample occurred in January 2008; repeats satisfactory, no non-acute MCL violation.

Every water system is required to develop a Coliform Monitoring Plan. Westside has a written coliform monitoring plan; currently using 3 routine sites. Repeat sites identified; hose bibs typically used as sample collection points. **Update your Coliform Monitoring Plan to address how Westside would address the Groundwater Rule and how you would provide notification to customers in the event of an emergency or *E.coli* event.** Please refer to our guidance document (<http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-036.pdf>); you can also find a word template on our website for you to use.

Lead and Copper: Westside is on a three year reduced monitoring schedule and is required to collect 10 samples from specific homes in the distribution system between January 2011 and December 2013. Westside collected 10 samples in September 2010 and the results were all below the action level of 0.015 mg/L for lead and 1.3 mg/L for copper.

Disinfection By Products: On reduced monitoring for Stage 1 DBP Rule, required to collect one sample (for TTHM and HAA5) per treatment plant (where chlorine is added to the system) at the same location once every three years. Last sample taken in September 2010 – HAA5 of 6.7 µg/L and TTHM of 30 µg/L; last Stage 1 sample due in summer 2013. **Must**

develop Stage 2 DBP monitoring plan and begin sampling for compliance by October 2013. Guidance on how to develop a monitoring plan can be found on our website or contact our DBP Program Lead, Jolyn Leslie, at (253) 395-6762.

Source Monitoring Requirements

Nitrate: Samples at S01 and S03 between 2007 to 2012 are all less than 0.71 mg/L. For S06, highest observed is 0.28 mg/L.

Arsenic: Samples taken prior to blending with Canyon Well for S01 and S03 show levels of 0.003 mg/L. Canyon Well (S06) has levels at 0.035 mg/L. MCL for arsenic is 0.010 mg/L.

Inorganic Chemicals: Low levels of nickel and cyanide observed in S03 in 2003. Also at S03, iron observed at 0.5 mg/L and manganese observed at 0.1 mg/L (SMCL for Mn at 0.05 mg/L). All other analytes below MCL for S01 and S03. Low levels of fluoride and zinc observed at S06 in 2010. Also at S06, iron observed at 0.097 mg/L and manganese observed at 0.086 mg/L; all other analytes below MCL for S06.

Volatile Organic Chemicals: Low levels of trihalomethane components observed at S01 and S03.

Synthetic Organic Chemicals: No analytes detected for S01, S03 or S06.

Radionuclides: For S01 and S03, radium 228 observed at 1.22 pCi/L. For S06, radium 228 observed at 1.07 pCi/L.

Please refer to the source monitoring requirements outlined in the Water Quality Monitoring Report (WQMR) sent to you by DOH during the first quarter of every year.

MANAGEMENT & OPERATIONS:

Westside elects a five-member Board to help manage the water system. Island Water Management provides certified operator to help run water system. Board meetings held every other month; certified operator attends. Board is engaged in water system operations and committed to helping make improvements and plan for future expenses.

Item	Status
Small Water System Management Program	<ul style="list-style-type: none">• Westside is required to develop a SWSMP to help efficiently operate and manage the water system for now and into the future. The document should be developed for internal use and does not need to be submitted to the Department. Reference the revised guidance document on our website: http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/SmallWaterSystemMgmt.aspx.• A majority of items appear to be assembled in binder presented during survey; check with SWSMP guidance to see what may be missing.

WFI Update	<ul style="list-style-type: none"> • WFI sent out annually to system for review and update. • Update number of existing connections on WFI.
Treatment Overview	<ul style="list-style-type: none"> • Disinfection provided at Sand Springs and driven well points; 4-log inactivation provided. Disinfection provided at Canyon Well (S06) when in use to meet peak demands. • In process of providing CCR to complete formal blending project report and conducting full scale pilot of the revised design for coagulation/filtration treatment system to remove arsenic from S06.
Consumer Confidence Report	In compliance, 2011 CCR received July 2, 2012.
Operating Permit	Green
Overall Design Approval	Approved for total of 227 connections. Westside appears to be overconnected; trying to buy back water shares.
Certified Operator	<ul style="list-style-type: none"> • WDM1 required. In compliance. When treatment goes online, a treatment certification will be required; notification will be sent to system from Operator Certification Program in Tumwater.
Operations and Maintenance Procedures	<ul style="list-style-type: none"> • Details for system components included below.
Flushing Program	<ul style="list-style-type: none"> • No formal flushing program in place.
Valves/Hydrants	<ul style="list-style-type: none"> • Exercise valves once per year; make repairs as necessary. • Working with Fire Department to exercise hydrants regularly; program getting underway.
Reservoir	<ul style="list-style-type: none"> • Conduct inspection of reservoir vents, hatches and overflows at least once per year.
O&M Manual	<ul style="list-style-type: none"> • A formal O&M Manual does not exist for this system. Develop O&M Manual for system; keep the manual at the pumphouse for residents to refer to if necessary. Document site visits, regular maintenance tasks, system repair, etc in a log book. This document will be invaluable for future operators of system.
Cross Connection Control Program	<ul style="list-style-type: none"> • Westside has a cross-connection program; authority in place through resolution and bylaws. • No real hazards; no known testable devices in service. • Conducted surveys in past; not a strong response. • Operator aware of homes with irrigation wells and knows they are disconnected.
Wellhead Protection Program	<ul style="list-style-type: none"> • Did not discuss in detail. • Develop/update a wellhead protection program as part of the SWSMP. Please refer to WAC 246-290-135 to determine the elements required for this program. Reference: http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/sourcewater/SourceWaterProtection.aspx

Water Use Efficiency	<ul style="list-style-type: none"> • WUE report submitted for 2010 and 2011. Goal developed in 2012 is to reduce customer consumption by ½ of 1%; equivalent to 1 gallon per customer per day. • Provide consumer education; install meters on spur lines to read when source meters show high usage; tiered rate structure in place May 2012.
Production Data	<ul style="list-style-type: none"> • Source meter at Green Tank read daily. • Canyon Well has source meter; new blending project installed a source meter to measure flow of Sand Spring and the driven well points. • Reports approx. 30,000 gpd usage in winter, 86,000 gpd in summer.
Consumption Data	<ul style="list-style-type: none"> • System is fully metered. • Consumer meters read every other month for billing purposes.
Distribution System Leakage	<ul style="list-style-type: none"> • In 2010 – DSL reported at 18.6% • In 2011 – DSL reported as 20.6%. • To establish an appropriate water use efficiency (WUE) goal, Westside must focus on a specific customer water use (such as gpd/connection) and identify a measurable water use savings (such as reduce use by 10 gallons per day or 3 percent per year). The goal must also have a timeframe in which it will be accomplished. • In next WUE report, include timeframe for when current goal will be achieved; also report progress on achieving goal and describe efforts made to improve WUE goals and DSL.
Financial Viability Program	<ul style="list-style-type: none"> • Have reserves in place; recently raised rates with tiered structure. • Conducted component inventory to assess life expectancy on system infrastructure. Developed 6 year CIP; rates in place to fund CIP.
Reliability	<ul style="list-style-type: none"> • Sources can flow by gravity; need power to pump up to reservoirs; can survive on storage for few days. • Community prepared for outages; not interested in paying for permanent emergency power.
Emergency Response Program	<ul style="list-style-type: none"> • Document /develop/improve Westside emergency response program as part of the SWSMP. • Reference: http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies.aspx. • Most common emergency is a line break; operator developed laminated cards in valve boxes to describe operation of system when a valve is shut. • System is able to live on storage during outages; have contact to get emergency power and coordinate with local purveyors if in need.

SANITARY SURVEY FINDINGS:

This report documents the findings of the sanitary survey site visit. The following summarizes findings that need your attention. Please provide me with a plan of how you plan to address each of the categories below within 45 days.

Significant Deficiencies:

None observed.

Other Findings:

None observed.

Observations:

1. Update your WFI to include the existing number of active single-family connections.
2. You are required to submit a Construction Completion Report on the blending project for the Canyon Well. I saw some of the appurtenances in place during the survey; however, a flow restrictor has not yet been installed. This restrictor must be in place to acknowledge the construction completion for this project.
3. It is my understanding that Westside Water would like to have the coagulation/filtration treatment facility in service to meet peak demands this summer. Some changes to the approved design were discussed. Please have your engineer submit a design detail for the proposed contact tank that will be placed outside of the existing building instead of adding smaller contact vessels. During the full scale pilot study, all water will be discharged to waste. Westside will be responsible for submitting the items agreed to with your engineer at the conclusion of the pilot study. This information must be reviewed and approved and a construction completion report must be submitted (and acknowledged by the Department) before treated water can be pumped into the distribution system for consumption.
4. If you plan to make changes to the transmission system for Sand Spring (S01) and the driven well points (S03) water, you are required to submit a project report (prepared by an engineer licensed in the State of Washington), describing the intended changes to the Department for review and approval.
5. All community water systems must comply with the Water Use Efficiency (WUE) Rule. In your upcoming WUE Report, report the time period you plan to meet your goal (e.g., reduce customer consumption by ½ of 1% by 2015). Also describe whether you have met the goal for the year and describe what actions you are taking to meet your goal. You are required to re-establish your WUE goal once every 6 years through a public process.
6. Every water system is required to develop and implement a Coliform Monitoring Plan (CMP). Please update your existing plan to include the proposed new routine sampling location (and associated repeat sample locations) we discussed at the survey. In addition, you must address how you will comply with the Groundwater Rule and how you would provide notification to customers in the event of an emergency or *E.coli* event in the updated plan. Please submit a copy of your CMP to the

Department for our files. Refer to the guidance document (which includes a template) on our website: <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-036.pdf>.

7. Westside must develop a Stage 2 DBP monitoring plan and begin sampling for compliance by October 2013. Guidance on how to develop a monitoring plan can be found on our website or contact our DBP Program Lead, Jolyn Leslie, at (253) 395-6762.
8. All water systems are required to develop a planning document for their system. Such a document will help an owner organize all documents relevant to water system operations and comply with state and federal drinking water laws. Please refer to Publication DOH 331-134, *Small Water System Management Program Guide* which can be found here: <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/SmallWaterSystemMgmt.aspx>. It is not necessary to submit the SWSMP to the Department at this time, but it should be available for review at the next sanitary survey. The binder you presented at the survey likely captures many elements required for the SWSMP. Please spend time developing and/or updating the following items: cross connection control program, wellhead protection program, O&M Manual, and emergency response program.

Recommendations:

1. It is important to routinely inspect the spring collection points and the integrity of the transmission lines. Recommend you inspect these facilities at least once per quarter.
2. Recommend you develop an O&M Manual that documents the system equipment, routine operations and preventative maintenance tasks. This document will be invaluable for future operators and residents of the system when your operator retires.
3. Thank you for providing photos of your reservoir vent, access hatch and screened overflow. Recommend the interior of both tanks be cleaned and inspected on a regular basis (e.g., once every five years).

When items are completed, please send me a status update and/or photo verification of the corrections made (as applicable). Include the system name, ID number, and the date the deficiencies were corrected. You can send them to me by e-mail at paige.igoe@doh.wa.gov or by mail at 20425 72nd Ave S, Suite 310, Kent, WA 98032.