

City of Sammamish Water Quality Monitoring 2019 Scope of Work

Under this scope of work, the King County Water and Land Resources Division (“County”) will provide services to the City of Sammamish (“City”) to monitor water quality and aquatic habitat (“Project”). Services will be provided pursuant to the 2007 Interlocal Agreement between the County and the City for surface water management services, effective September 26, 2007. It is anticipated that the monitoring services will be provided throughout 2019, with reports written and delivered in 2020. Water quality monitoring in years beyond 2019 will be negotiated through a new scope of work.

Introduction and Background

The City of Sammamish faces new water quality challenges from rapid urban growth and is exploring methods to bolster its current water quality monitoring program. Current monitoring efforts by the City and King County within the City of Sammamish are limited in scale and do not provide City Staff with the means to identify pollution sources or develop projects that improve water quality.

In 2018, County and City staff collaborated on the Sammamish Water Quality and Aquatic Habitat Monitoring Plan (“Plan”), which identified key gaps and developed a list of priority recommendations for monitoring activities. The Plan was adopted by the Sammamish City Council by resolution on September 18th, 2018.

Project Objective and Tasks

This project will implement monitoring activities identified in the Plan. In 2019, King County will provide the following monitoring services to the City. In 2020, King County will produce written reports for monitoring data collected throughout 2019. Section numbers from the Plan are included for reference.

- 8.4: Revise Ebright Creek watershed monitoring
 - Continuous flow and temperature gaging in stormwater outfalls (3 sites).
 - Monthly turbidity measurements in stormwater outfalls (3 sites).
 - Continuous wetland water-level gaging (2 sites).
 - Channel morphology and streambed substrate assessment
 - Benthic Indicator of Biotic Integrity (B-IBI) annual sampling
- 8.5: Monitor Zackuse Creek
 - Monthly routine stream water quality monitoring
 - Annual B-IBI sampling

- Continuous streamflow and temperature gaging
- 8.6: Assess entombment of kokanee spawning areas
- 8.7: Measure stream health at upstream sites (5 sites)
 - Annual B-IBI sampling
- 8.9: Record water level in the headwater wetlands of George Davis Creek and Allen Lake (2 sites total)
- 8.10: Assess riparian tree cover (at 5-yr intervals, assessing one-fifth of the City each year)
- 8.11: Record rainfall at City Hall
- Monitor water quality at stormwater facility outfalls

The project is divided into 6 tasks, grouped by activity type rather than by waterbody/watershed. The Ebright Creek watershed monitoring is separated into its own task, since the Chestnut Lane and the Crossings at Pine Lake communities contribute monetarily to this monitoring effort, as required by their respective plat conditions.

Task 1. Hydrology monitoring

County staff will install and maintain hydrology gages to collect data such as streamflow, temperature, water level, and/or precipitation.

Monitoring activities included in this task:

- Zackuse Creek
 - Continuous streamflow and temperature gaging (1 site)
- George Davis Creek and Allen Lake watersheds
 - Continuous wetland water-level gaging (2 sites total)
- City Hall
 - Rainfall gaging (1 site)

Tasks to be performed by County staff:

- Coordinate gage sites with City staff and landowners
- Purchase and install gaging equipment
- Conduct regular site visits (4 to 6 per year) to maintain gages and download data
- Process and quality-check data
- Post data to County webpage

Deliverables:

- Hydrology gages purchased, installed, and maintained
- Data made publicly available on County webpage

Task 2. Stream monitoring

King County will monitor stream water quality and aquatic habitat using field measurements and laboratory analyses.

Monitoring activities included in this task:

- Zackuse Creek (1 site)
 - Monthly water quality monitoring for:
 - Bacteria
 - Nutrients (nitrogen and phosphorus)
 - Conventional (e.g., conductivity, turbidity, dissolved oxygen, pH)
 - Annual B-IBI sampling
 - Metals sampling (e.g., mercury, lead, copper, zinc), plus dissolved organic carbon (DOC) to assess toxicity
 - 3 to 4 wet-weather samples (i.e., following ¼-inch or more of rainfall)
 - 1 to 2 baseflow samples
- Assess entombment of kokanee spawning areas in Ebright, George Davis, Pine Lake, and Zackuse Creeks
 - Annual field assessment
- Measure stream health at 5 upstream sites: two on Laughing Jacobs Creek, and one each on George Davis, Kanim, and Pine Lake Creeks.
 - Annual B-IBI sampling

Tasks to be performed by County staff:

- Conduct field measurements and collect samples
- Deliver water samples to the King County Environmental Laboratory, and send B-IBI samples to a contract laboratory
- Analyze water samples and ensure analytic quality control
- Coordinate B-IBI analyses with contract laboratory and receive data
- Process and quality-check data
- Post data to County website

County staff will also develop a formal Sampling and Analysis Plan (SAP) for the entombment monitoring. All monitoring requires a SAP that details sampling procedures, field safety, and quality assurance measures. Most monitoring activities in this scope of work are covered by existing SAPs, but the entombment monitoring is a new type of monitoring for King County and will require a new SAP.

Deliverables:

- Data publicly available on County website or delivered to City by e-mail
- SAP for entombment monitoring

Task 3. Riparian monitoring

County staff will use remotely sensed data to map tree cover in riparian areas along Sammamish's streams and lakes. All riparian areas within Sammamish city limits are included in this monitoring activity. Approximately one-fifth of the riparian area will be mapped in 2019.

Tasks to be performed by County staff:

- Delineate riparian areas and define 2019 project area
- Map tree cover, using remotely sensed data such as aerial photographs and LIDAR measurements
- Quantify percent tree cover in stream and shoreline segments

Deliverable:

- Map of tree cover delivered to City by e-mail (PDF and GIS files)

Task 4. Ebright Creek watershed monitoring

County staff will monitor hydrology, water quality, and aquatic habitat in and near Ebright Creek to monitor for impacts from recent developments. These monitoring activities are intended to meet the requirements of the City's Settlement Agreement with the Friends of Pine Lake, and the Chestnut Estates and Crossings at Pine Lake Plat Development Conditions.

Monitoring activities included in this task:

- Continuous flow and temperature gaging in stormwater outfalls (3 sites).
- Monthly turbidity measurements in stormwater outfalls (3 sites).
- Continuous wetland water-level gaging (2 sites).
- Channel morphology and streambed substrate assessment
- Annual B-IBI sampling

Tasks to be performed by County staff:

- Coordinate gage sites with City staff and landowners
- Purchase and install gaging equipment
- Conduct regular site visits (4 to 6 per year) to maintain gages and download data
- Conduct field measurements and collect samples
- Deliver water samples to the King County Environmental Laboratory
- Analyze water samples and ensure analytic quality control
- Coordinate B-IBI analyses with contract laboratory and receive data
- Post gage data to County webpage

Deliverables:

- Hydrology gages purchased, installed, and maintained
- Data made publicly available on County webpage or delivered to City by e-mail

Task 5. Stormwater facility monitoring

County staff will monitor water quality at two stormwater outfalls near the intersection of Inglewood Hill Rd (NE 8th St) and 228th Ave SE. Samples will be collected on 3 to 4 dates during wet-weather conditions, rather than on a fixed schedule, and analyzed for turbidity and metals (e.g., mercury, lead, copper, zinc).

Tasks to be performed by County staff:

- Collect water samples
- Deliver water samples to the King County Environmental Laboratory
- Analyze water samples and ensure analytic quality control
- Process and quality-check data
- Post data to County website

Deliverable:

- Data delivered to City by e-mail

Task 6. Project Management and Reporting

County staff will compile an annual dataset of all project data collected the previous calendar year, and deliver to City staff by e-mail. County staff will also prepare and deliver annual reports that display and interpret data from the previous calendar year. Because the report and dataset contain data collected through the end of 2019, they will be prepared and delivered in 2020.

This task also includes preparing invoices and communicating progress with the City's project manager.

Tasks to be performed by County staff:

- Prepare and deliver quarterly invoices
- Communicate progress quarterly, and as needed for specific activities
- Develop new report format and automation tools
- Consult with City staff to ensure report meets City needs
- Compile and analyze data
- Prepare annual dataset
- Prepare and review annual report

Deliverables:

- Quarterly invoices and progress reports
- Annual dataset
- Draft and final annual report (Word files, and PDF file of final report)

Schedule

Monitoring activities will begin in January 2019 and continue through December 2019, at the frequency indicated for each monitoring activity. Reporting activities will be completed by March 31, 2020, with final invoice submitted by April 30, 2020.

Data will be provided to City staff as they are available throughout 2019, either posted on County webpages or e-mailed to City staff. The following list gives approximate turnaround times typical for different types of data:

- Bacteria, nutrients, conventionals: One month after sampling
- Entombment, channel morphology, substrate: Two weeks after sampling
- Metals: Stormwater facility data will be available by June 2019. Zackuse Creek data will be available one month after the last sampling date (these samples will likely be analyzed as a single laboratory batch).
- B-IBI: 3 to 4 months after sampling
- Real-time rainfall: Data are transmitted every hour
- Other hydrology data: Gages are manually downloaded 4 to 6 times per year, and data are available one month after downloading

These turnaround times are approximate, and will sometimes be extended due to factors such as re-running lab analyses, manually verifying gage readings, or performing additional quality-control work.

Staffing

King County:

- Daniel Nidzgorski, Limnologist.
 - Primary County point of contact and County Project Manager
 - Technical advisor

City of Sammamish:

- Danika Globokar, P.E., Associate Stormwater Engineer
 - Primary City point of contact and City Project Manager
 - Recipient for invoices and deliverables

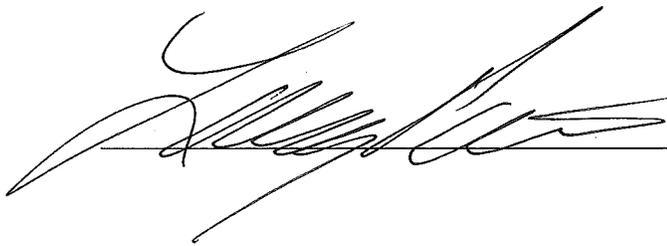
Budget

The estimated cost for this project for monitoring in 2019 (and reporting in 2020) is \$88,850, broken down by task in the following table. Costs for the first monitoring year, 2019, are expected to be higher than costs for future monitoring years due to project start-up costs: e.g., equipment purchase and installation (monitoring gages), developing a SAP for the entombment study, developing the annual report format and automation tools.

| Task | Cost |
|---------------------------------------|-----------------|
| 1) Hydrology monitoring | \$18,750 |
| 2) Stream monitoring | \$28,500 |
| 3) Riparian monitoring | \$4,500 |
| 4) Ebright Creek watershed monitoring | \$16,700 |
| 5) Stormwater facility monitoring | \$11,400 |
| 6) Project management and reporting | \$9,000 |
| TOTAL | \$88,850 |

Signatures

Authorized for City of Sammamish:



Interim City Manager

Title

Date: 12/12/2018

Authorized for King County:

Josh Baldi
Josh Baldi

Division Director
Title Water & Land Resources Division
Natural Resources and Parks

Date: 12.5.18