

April 19, 2016

Mr. Dale Myers
Site Manager
Toxics Cleanup Program
Washington State Department of Ecology – Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008-5452

**RE: 2015 and 2016 Groundwater Monitoring and Sampling and Assessment of Sediment
Yarrow Bay Yacht Basin and Marina
5207 Lake Washington Boulevard NE
Kirkland, Washington 98033
Washington Department of Ecology Voluntary Cleanup Program No.: NW1791
ATC Project No. Z076000030**

Dear Mr. Myers:

On behalf of Yarrow Bay Yacht Basin and Marina, ATC Group Services, LLC (ATC) has prepared this report describing groundwater monitoring and sampling and sediment sampling performed at the Yarrow Bay Yacht Basin and Marina located at 5207 Lake Washington Boulevard Northeast in Kirkland, Washington (site [Figure 1]). The monitoring and sampling events, conducted over four (4) consecutive quarters beginning in June, 2015, were completed in accordance to ATC's October 20, 2014 *Groundwater Monitoring Program and Sediment Sampling Work Plan*, which was submitted to the Washington Department of Ecology (Ecology) in response to July 21, 2014 letter from Ecology requesting a status update regarding remedial actions performed at the site.

The objective of the remedial actions was to continue to monitor the natural attenuation of previously identified impacts to site groundwater and sediment with regard to compliance to the Model Toxics Control Act (MTCA) and its implementation regulations defined in Revised Code of Washington (RCW) Chapter 70.105D and Washington Administrative Code (WAC) Chapter 173-340 and, if compliance is met, to request a No Further Action determination from Ecology through their Voluntary Cleanup Program (VCP).

SITE DESCRIPTION AND BACKGROUND

The site is a boat storage marina and fueling facility located on Lake Washington in a mixed-use commercial and residential area in Kirkland, Washington, and comprises approximately 45,000 square feet.

Environmental assessment activities were initiated by Sound Environmental Strategies of Seattle, Washington, in 2006 in which concentrations of gasoline-range organics (GRO), diesel-range organics (DRO); and/or benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in soil and groundwater in the vicinity of the former fuel dispenser and concentrations of DRO were detected in groundwater samples collected from a groundwater monitoring well formerly located down-gradient of the now removed underground storage tanks (USTs) and from soil borings advanced within and proximate to, the former engine repair shop.

In 2008, Farallon Consulting, LLC (Farallon) of Issaquah, Washington, oversaw the removal of one 8,000-gallon capacity gasoline UST and a 1,750-gallon capacity diesel UST from a common UST pit located in

the northeast portion of the site and an associated fuel dispenser located along the Lake Washington bulkhead. During the 2008 UST and dispenser removal activities, approximately 200 tons of petroleum and carcinogenic polycyclic hydrocarbon (cPAH) impacted soil was removed from a location proximate to the fuel dispenser. The removed petroleum contaminated soil was disposed of offsite. A quantity of petroleum impacted soil at the fuel dock was left in place due to structural limitations associated with undermining the bulkhead.

Farallon also installed three groundwater monitoring wells designated MW-8, MW-9, and MW-10 at the site from which groundwater monitoring and sampling were performed over four (4) events from December, 2008 through October, 2009. Laboratory analytical results from the groundwater samples collected indicated that petroleum hydrocarbons were not present in concentrations above analytical method reporting limits.

In 2010, the site was entered into Ecology's VCP (VCP site number NW1791) with a request for a No Further Action determination based on the remedial actions performed above. A November 3, 2010 advisory opinion letter (issued under the specific authority of RCW 70.105D.030[1][i] and WAC 173-340-515[5]) from Ecology indicated that previous detected cPAH impacts to soil had been addressed. As a result of the remaining petroleum hydrocarbon impacted soil located along the bulkhead, Ecology requested quarterly groundwater sampling from an onsite groundwater monitoring well (MW-1 [Figure 2]) located adjacent to the bulkhead and sediment sampling at three locations along the marina. The location of groundwater monitoring well MW-1 and sediment sample locations SD1, SD2, and SD3 are shown on **Figure 2**. The sampling was to continue until four consecutive quarters of groundwater and the annual sediment samples exhibit compliance with MTCA cleanup regulations, after which the property owner can submit the sampling data along with a Feasibility Study with a Disproportionate Cost Analysis to Ecology, in order to obtain a No Further Action determination with a restricted covenant for the remaining petroleum impacted soil. Quarterly groundwater sampling and annual sediment sampling was conducted between 2010 and 2012 and then resumed in September, 2014.

OBJECTIVE AND SCOPE OF WORK

In order to assess the natural attenuation of petroleum hydrocarbons in groundwater from onsite groundwater monitoring well MW-1, groundwater monitoring and sampling was conducted on June 30, 2015, September 30, 2015, December 16, 2015, and February 29, 2016. Furthermore, in order to continue to assess the presence of petroleum hydrocarbons in sediment at the corner of the bulkhead and the covered dock, north of covered dock, and south of the covered dock, sediment samples were collected from sediment sample locations SD1, SD2, and SD3.

Groundwater Monitoring Well Sampling

On June 30, 2015, September 30, 2015, December 16, 2015, and February 29, 2016, ATC collected groundwater samples from groundwater monitoring well MW-1 using the standard operating procedure for low-flow sampling.

Prior to collection of the groundwater samples, groundwater monitoring well MW-1 was purged using low-flow sampling techniques. During low-flow groundwater sampling, high density polyethylene (HDPE) tubing is lowered into the well until set within middle of the screen interval. Groundwater is then purged by means of a peristaltic pump set at a steady flow rate while maintaining a drawdown of less than 0.33 feet. After a minimum of one tubing volume (including the volume of water in the pump and flow cell) was purged, water-quality indicator parameters, including turbidity, dissolved oxygen, specific electrical conductance (specific conductance), pH, temperature, and oxidation-reduction potential (ORP) are recorded every three to five minutes until stabilization occurs. The stabilization criterion is based on three

successive readings of the water quality field parameters. Stabilization is considered to have occurred when the following criteria are met, although due to geologic heterogeneities within the screened interval and site-specific conditions, adjustments on flow rate and stabilization criteria may be required:

- pH \pm 0.1 pH
- Specific Conductance \pm 3%
- ORP \pm 10 millivolts (mV)

After achievement of stabilization, the well is considered purged, and a sample is collected in laboratory-prepared containers from the discharge port of the pump. Collected samples were sub-packed in new zippered plastic bags and stored on ice in portable coolers at approximately 4°C. A temperature compliance vial accompanied each cooler to verify that proper holding temperature was maintained until delivery to the analytical laboratory. A chain-of-custody form accompanied each sample cooler containing laboratory samples.

The well purge logs presented in **Appendix A** contain record of the low-flow sampling parameters recording during the June 30, 2015, September 30, 2015, December 16, 2015, and February 29, 2016 groundwater sampling events.

Sediment Sampling

On September 30, 2015, ATC collected sediment samples from sediments at locations SD1, SD2, and SD3 representative of the corner of the bulkhead and the covered dock, north of covered dock; and south of the covered dock. Sediment was collected by accessing lake-bed sediments using a slide hammer tool fitted with a 6-inch length core barrel sampler and driving the core barrel approximately 4-6 inches into the sediment. After collection of each sediment sample, the core-barrel sampler was decontaminated using a bio-degradable detergent and potable water wash followed by a final rinse with distilled water. New nitrile gloves were worn between each sample location.

Each sample was decanted into laboratory-prepared containers directly from the core barrel. The samples were sub-packed in new zippered plastic bags and stored on ice in portable coolers at approximately 4°C. A temperature compliance vial accompanied the cooler to verify that proper holding temperatures were maintained until delivery to the analytical laboratory.

A chain-of-custody form sealed in a plastic zippered bag will accompanied the sample cooler containing laboratory samples.

Analytical Methods

Groundwater samples collected from groundwater monitoring well, MW-1, during the field activities were submitted to Fremont Analytical of Seattle, Washington, an Ecology accredited analytical laboratory. The groundwater and sediment samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by Ecology Method NWTPH-Gx, TPH as diesel and heavy oil by Ecology Method NWTPH-Dx/ Extended and BTEX by United State Environmental Protection Agency (EPA) Method 8260.

The laboratory analytical reports are presented in **Appendix B**.

FINDINGS

Depth to Water

Static groundwater was measured from top of casing in groundwater monitoring well MW-1 on June 30,

2015, September 30, 2015, December 16, 2015, and February 29, 2016, during groundwater sampling activities; static groundwater was measured between 3.31 and 4.84 feet below top of well casing (BTOC).

Groundwater Analytical Results

Groundwater samples were analyzed for gasoline, diesel and oil-range petroleum hydrocarbons, and BTEX.

Diesel was detected in the groundwater samples collected from the June 30, 2015, September 30, 2015, and the February 29, 2016 groundwater sampling events at concentrations of 397, 484, and 82.6 micrograms per liter ($\mu\text{g/L}$) or parts per billion (ppb) respectively. These concentrations are below the MTCA Method A cleanup value of 500 $\mu\text{g/L}$ for diesel in groundwater. Diesel was not detected above the laboratory method reporting limit in the groundwater sample collected during the December 16, 2015 groundwater sampling event.

Heavy oil was detected in the groundwater samples collected from the December 15, 2015, and the February 29, 2016, groundwater sampling events at concentrations of 327 and 415 $\mu\text{g/L}$ respectively. These concentrations are below the MTCA Method A cleanup value of 500 $\mu\text{g/L}$ for heavy oil in groundwater. Heavy oil was not detected above the laboratory method reporting limit in the groundwater samples collected during the June 30, 2015, and September 30, 2015 groundwater sampling events.

Gasoline and BTEX were not detected above laboratory method detection limits in any of the groundwater samples events.

A summary of the laboratory analytical results from the recent sampling events and prior groundwater sampling events is presented as **Table 1**. **Figure 3** shows dissolved petroleum hydrocarbon concentrations for each of the recent groundwater sampling events.

Sediment Analytical Results

Sediment samples were analyzed for gasoline, diesel and oil-range petroleum hydrocarbons, and BTEX.

Laboratory analytical results from sediment samples collected on September 30, 2015, at locations SD1, SD2, and SD3, did not contain detections of petroleum hydrocarbons or BTEX above laboratory method reporting limits except in sediment sample YB-02-SD2 where a concentration of 240 micrograms per kilogram (mg/kg) heavy oil was detected. The concentration is below the MTCA Method A soil cleanup level for unrestricted land uses of 2,000 mg/kg for heavy oil.

A summary of the laboratory analytical results from the September 30, 2015 sampling event and prior sediment sampling events is presented as **Table 1**. **Figure 3** shows petroleum hydrocarbon concentration for the September 30, 2015, sediment sampling event.

Investigation Derived Waste

All well purge water generated during the June 30, 2015, September 30, 2015, December 16, 2015, and the February 29, 2016 groundwater sampling events was containerized in a 30-gallon drum. The waste is slated to be disposed of pending approval of a waste profile with ORRCO at their disposal facility in Portland, Oregon. A copy of the non-hazardous waste manifest will kept in ATC files.

CONCLUSIONS and RECOMMENDATIONS

The monitoring and sampling events, conducted over four (4) consecutive quarters beginning in June, 2015-2016, were completed in accordance to ATC's October 20, 2014 *Groundwater Monitoring Program and Sediment Sampling Work Plan*. Laboratory analytical results from the groundwater and sediment

samples collected during those events do not contain concentrations of petroleum hydrocarbons or BTEX compounds above regulatory cleanup levels and are therefore are in compliance with the MTCA and its implementation regulations (RCW 70.105D and WAC 173-340).

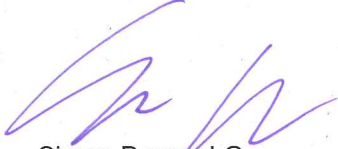
CERTIFICATION

The information provided in this *2015-2016 Groundwater Monitoring and Sampling and Assessment of Sediment* (dated April 14, 2016), for the Yarrow Bay Yacht Basin and Marina located at 5207 Lake Washington Boulevard NE in Kirkland, Washington was prepared under the supervision of an ATC State of Washington Licensed Geologist.

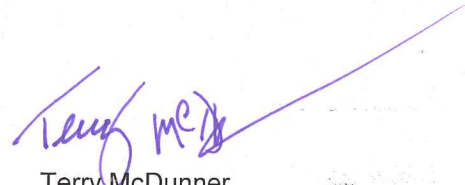
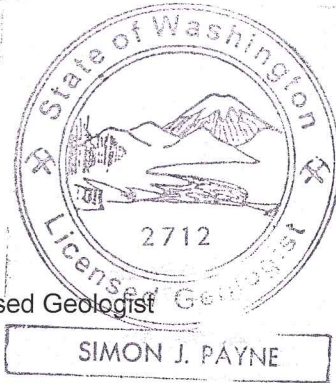
A professional geologist's certification of conditions comprises a declaration of his or her professional judgement. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations and ordinances.

We appreciate the opportunity to be of service in this matter. If you have questions regarding this report, please contact us at (206) 781-1449.

Sincerely,
ATC Group Services LLC



Simon Payne, LG
State of Washington Licensed Geologist
Project Geologist



Terry McDunner
Branch Manager



Nasrin Bastami
Project Manager

Attachments:

Table 1 - Summary of Analytical Results - Groundwater

Table 2 - Summary of Analytical Results - Sediment

Figure 1 – Site Vicinity Map

Figure 2 – Groundwater Monitoring Well and Sediment Sampling Locations

Figure 3 – Groundwater and Sediment Analytical Data

Appendix A - Well Purge Logs

Appendix B - Laboratory Analytical Reports and Chain of Custody Documentation

TABLES