Cardno ATC
Shaping the Future

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LETTER OF TRANSMITTAL

DATE: October 21, 2014

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

FROM: Nasrin Bastami

WE ARE SENDING YOU ❑ Attached ❑ Under separate cover via the following:

❑ Shop Drawings ❑ Prints ❑ Plans ❑ Samples

❑ Specifications ❑ Copy of Letter ❑ Change Order ❑ Reports

❑ Work plan Report.

Original	Date	No.	Description
X	10/20/2014	1	**Groundwater Monitoring Program and Sediment Sampling Work Plan**

THESE ARE TRANSMITTED as checked below:

❑ For approval ❑ For your use ❑ As requested ❑ For review and comment

❑ REMARKS: Please contact me at 206-781-1449 with any questions. Thank you.

COPY TO: Mr. and Mrs. Bortko/ Yarrow Bay Yacht Basin And Marina

FILE

SIGNED: Nasrin Bastami

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October 20, 2014

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: Groundwater Monitoring Program and Sediment Sampling Work Plan
Yarrow Bay Yacht Basin and Marina
5207 Lake Washington Boulevard NE
Kirkland, Washington 98033
Cardno ATC Project No. 076.40540.0003
Washington Department of Ecology VCP Project No: NW1791

Dear Mr. Myers:

Cardno ATC is pleased to submit this Work Plan on behalf of Mr. and Mrs. Bortko in response to a Washington State Department of Ecology (Ecology) letter dated July 21, 2014, which requested a status update regarding remedial actions performed at the Yarrow Bay Marina, located at 5207 Lake Washington Boulevard Northeast in Kirkland, Washington. Petroleum hydrocarbon impacts to groundwater and sediment at the subject property (Site) are currently being monitored for natural attenuation in order to receive a No Further Action determination from Ecology through their Voluntary Cleanup Program (VCP).

Based on the 2010 Opinion Letter from Ecology and the results of the sampling that occurred from 2010 to 2012, additional quarterly groundwater sampling of the existing monitoring well, MW-1, is proposed at the Site. In addition Cardno ATC proposes one round of sediment sampling to be conducted in conjunction with one of the groundwater sampling events in order to collect representative data to determine if petroleum hydrocarbons are present in the sediment along the marina and bulkhead. Groundwater monitoring and sampling will be conducted quarterly until concentrations of contaminants of concerns (COCs) are below the respective Model Toxics Control Act (MTCA) Method A cleanup values for at least four consecutive quarters.

SITE DESCRIPTION AND BACKGROUND

The subject property is located in a mixed-use commercial and residential area in Kirkland, Washington, and comprises approximately 45,000 square feet. The Site is developed with the Yarrow Bay Marina which includes a marina, boat repair and fueling facility.

According to the Closure Report by Farallon Consulting, LLC., dated January 8, 2010, cleanup action activities were conducted from March to September 2008 at the Site. According to this report, the cleanup action included removal of two underground storage tanks (USTs) and the former fuel dispenser, excavation and disposal of approximately 200 tons of impacted soil from a location proximate to the fuel dispenser in March, 2008. Petroleum impacted soil at the fuel dock was left in place due to structural limitations associated with undermining the bulkhead.

In 2010 an application to Ecology's VCP was submitted in order to obtain a NFA determination for the Site. A November 3, 2010 Opinion Letter from Ecology indicated that as a result of the remaining petroleum hydrocarbon impacted soil, Ecology requested quarterly groundwater sampling from an onsite groundwater monitoring well (MW-1) located adjacent to the bulkhead, and sediment sampling at three locations along the marina.

Subsequent to entering the Site into the VCP, four quarterly groundwater sampling events and three annual sediment sampling events were conducted from 2010 to 2012. Results of the sampling show an intermittent presence of heavy oil and diesel in groundwater. The concentrations of heavy oil and diesel in groundwater were above the MTCA Method A cleanup values in groundwater and, therefore, it was determined that additional sampling of the groundwater would be necessary to meet the requirements for the NFA determination for the Site. Additionally, Ecology recommended that one sediment sampling event be completed to verify the status of the sediment conditions at the property.

SCOPE OF WORK

The scope of work to be conducted as part of this assessment includes four quarterly groundwater sampling events from the existing monitoring well MW-1 and one sediment sampling event at three locations along the marina/ bulkhead. The scope of work is summarized in the following tasks:

- Develop a project-specific Health and Safety Plan (HASP);
- Collect groundwater samples from groundwater monitoring well, MW-1, for four consecutive quarters.
- Collect one set of sediment samples at three locations along the marina and bulkhead (see Figure 2).
- Groundwater and sediment samples to be analyzed by a Washington Department of Ecology certified laboratory.
- Place investigation-derived waste (IDW) generated during these activities into labeled 55-gallon drums pending characterization and disposal at a state approved facility. IDW will be temporarily stored at the project site until characterization is complete;
- A written report will be prepared and submitted to the Washington State of Ecology and Mr. and Mrs. Bortko (property owners) describing the field activities including the groundwater sampling and sediment sampling, laboratory analytical results, and any conclusions and recommendations based on those results, including a recommendation for a NFA determination should analytical results indicate compliance with MTCA.

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SAMPLING AND ANALYSIS PLAN

Groundwater Sampling Procedures

Prior to collection of the groundwater samples, groundwater monitoring well, MW-1, will be purged using low-flow sampling techniques. During low-flow groundwater sampling, high density polyethylene (HDPE) tubing is lowered into the well until set within 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) is 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 ± 0.1 pH units
- Specific Conductance ± 3%
- ORP ± 10 millivolts (mV)

After achievement of stabilization, the well is considered purged, and the samples will be collected in laboratory-prepared containers from the discharge port of the pump.

Subsequent to the initial groundwater sampling event, Cardno ATC will conduct three additional sampling events on a quarterly basis. Groundwater samples will be collected from one monitoring well and submitted for analysis.

Sediment Sampling Procedures

The sediment samples will be collected from the lakebed in 3 locations: 1) the corner of the bulkhead and the covered dock; 2) north of covered dock; and 3) south of the covered dock. The sediment samples will be collected by using a slide hammer tool fitted with a 6-inch length core barrel sampler and driving the core approximately 4-6 inches into the sediment. After each sediment sample, the core-barrel sampler will be decontaminated using an alconox detergent and potable water wash followed by a clean potable water rinse and a final rinse with distilled water.

Equipment Decontamination

Groundwater and sediment sampling equipment will be decontaminated prior to initiating sampling activities, between sampling locations, and upon completion of sampling activities. Field sampling equipment used in the collection of groundwater samples will be decontaminated by washing with an alconox detergent and potable water wash followed by a clean potable water rinse and a final rinse with distilled water.

Analytical Laboratory Analysis

Groundwater and sediment samples will be stored in coolers with ice after collection and during transportation to the laboratory. Samples will be sub-packed in new zippered plastic bags and stored in the dark at approximately 4°C. A temperature compliance vial will accompany each cooler to verify that proper holding temperatures were maintained during transport.

A chain-of-custody form sealed in a plastic zippered bag will accompany each sample cooler containing laboratory samples. The Cardno ATC field personnel will retain a copy of the chain-of-custody, and the original will be sent with the samples to the laboratory.

Groundwater and sediment samples submitted for chemical analysis will be delivered to a Washington State certified laboratory and analyzed within standard holding times. Groundwater and sediment samples will be analyzed for the following contaminants of concern (COC) using the following methods:

- Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX), by United State Environmental Protection Agency (EPA) Method 8260B;
- Total petroleum hydrocarbons as gasoline (TPHG) by Ecology Method NWTPH-Gx;
- Total petroleum hydrocarbons as diesel (TPHD) using Ecology Method NWTPH-Dx with silica gel cleanup;

Data Evaluation

COC concentrations in groundwater and sediment will be compared to MTCA Method A cleanup levels. Applicable cleanup values for the COCs are provided below:

- Gasoline Range Organics (GRO), 800 microgram/Liter (µg /L) when Benzene present in groundwater,
- Diesel Range Organics (DRO), 500 µg /L
- Benzene, 5 µg /L
- Toluene, 1,000 µg /L
- Ethybenzene, 700 µg /L
- Xylene 1,000 µg /L

Investigation-Derived Waste

Investigation-derived wastes (IDW) in the form of purge and decon wastewater are expected to be generated during field activities. Soil and wastewater generated during field activities will be placed in Department of Transportation-approved 55-gallon drums. A soil sample and a wastewater sample will be collected from these drums for waste profiling, in order to appropriately disposing the waste. The drums will be sealed, labeled, and temporarily stored on site. Arrangements for proper disposal and/or recycling of IDW will be made upon receipt of final analytical results for soil and groundwater.

Report Generation

Cardno ATC will compile the field data into a Groundwater and Sediment Assessment Report upon receipt of laboratory analytical data. This report will be submitted to the Washington State Department of Ecology and Mr. and Mrs. Bortko for review. The report will present a description of field activities and analytical laboratory results. This report will also include laboratory reports, well purge log, and chain-of-custody documentation as attachments. This report will also include a description of the methods and procedures used, any assumptions made, findings conclusions, and Cardno ATC recommendations.

SCHEDULE

The field activities outlined in this Work Plan is scheduled to begin on third quarter of 2014. This schedule may be delayed or accelerated by weather, or other factors.

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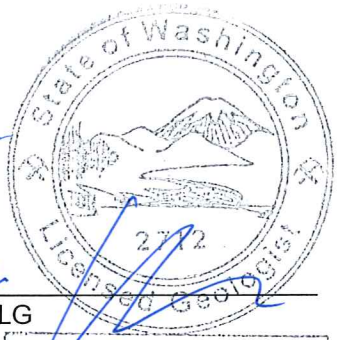
We appreciate the opportunity to be of service in this matter. If you have questions regarding this work plan, please contact us at 206-781-1449.

Sincerely,

Cardno ATC



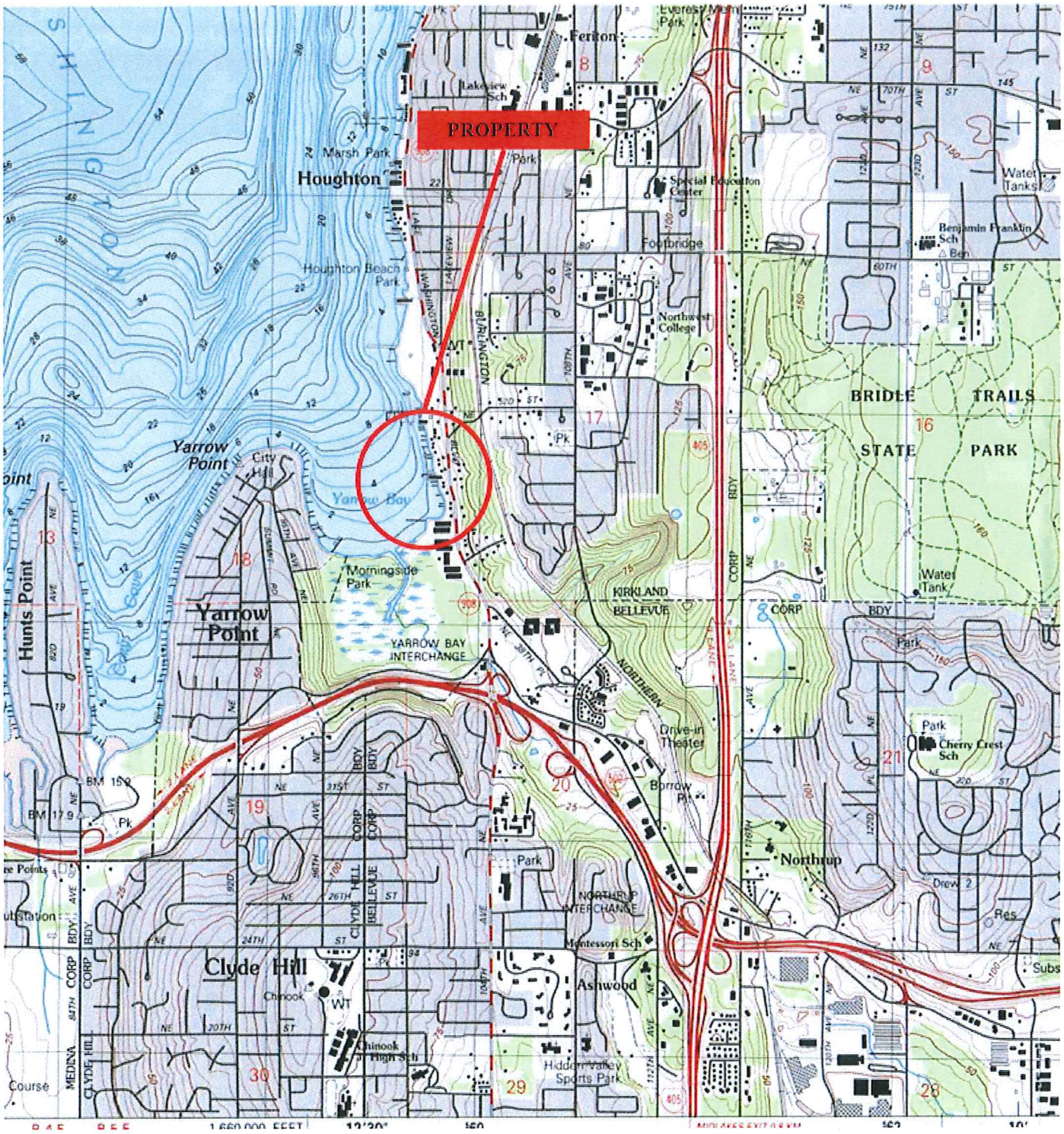
Simon Payne, LG
Project Manager

SIMON J. PAYNE

Nasrin Bastami
Project Manager

CC: Mr. and Mrs. Bortko

File



SOURCE: USGS Topographic Map, Bellevue South, WA Quadrangle, 7.5 Minute Series, Dated 1982

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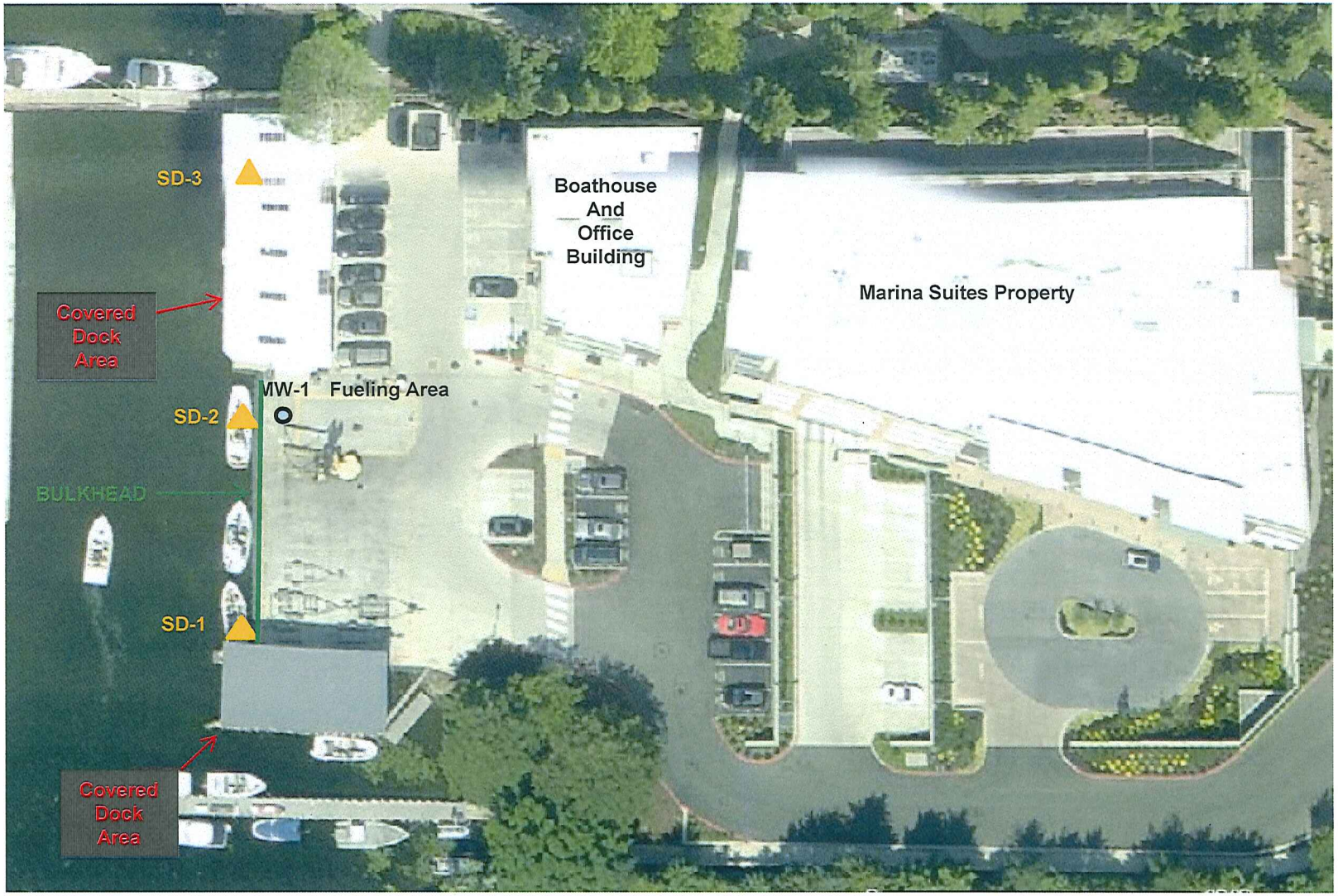
PROJECT NO.: 076.40540.0003		
APPENDIX A	SCALE:N/A	REVIEWED BY: NB
DRAWN BY: N/A	DATE: 9/2014	FILE: SITE VICINITY

FIGURE 1

YARROW BAY YACHT BASIN AND MARINA
5207 LAKE WASHINGTON BOULEVARD NE
KIRKLAND, WASHINGTON



Proposed Sediment Sampling Locations

Existing Monitoring Well Location

Reference: King County iMap 2009

Cardno ATC Shaping the Future	6347 Seaview Avenue Northwest Seattle, WA 98107	
PROJECT NUMBER: 076.40540.0003		
DESIGNED BY: ATC	SCALE: NTS	REVIEWED BY: TM
DRAWN BY: NB	DATE: 09//2014	FIGURE 2

FIGURE 2
Groundwater Monitoring Well and Proposed Sediment Sampling Locations

Yarrow Bay Yacht Basin And Marina
5207 Lake Washington Boulevard NE
Kirkland, Washington 98033