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January 27, 2021

Matthew Morris
Washington State Department of Ecology
Toxics Cleanup Program
PO Box 47775
Olympia, Washington 98504-7775

RE: DATA GAP INVESTIGATION ADDENDUM TO THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
GIG HARBOR SPORTSMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON
FARALLON PN: 1303-001

Dear Matthew Morris:

Farallon Consulting, L.L.C. (Farallon) has prepared this Addendum to the *Final Remedial Investigation/Feasibility Study Work Plan, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington* dated August 30, 2016, prepared by Farallon (RI/FS Work Plan) to present the scope of work for this Data Gap Investigation for the Gig Harbor Sportsman's Club (GHSC) property at 9721 Burnham Drive Northwest in Gig Harbor, Washington (herein referred to as the GHSC Property) (Figure 1). GHSC has entered into Agreed Order No. DE 12803 with the Washington State Department of Ecology (Ecology) to complete an RI/FS for the GHSC Property. The purpose of this Data Gaps Investigation is to provide the scope of work for additional sampling activities to support development of the remedial investigation. The results from the investigation will be used to develop, evaluate, and select technically feasible cleanup alternatives in accordance with the Washington State Model Toxics Control Act Cleanup Regulation, as set forth in Chapter 173-340 of Washington Administrative Code (WAC) 173-340; and the Washington State Sediment Management Standards, as set forth in WAC 173-204.

BACKGROUND

Field sampling activities between January 2017 and May 2020 are presented in the *Draft Remedial Investigation Report, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington* dated September 28, 2020, prepared by Farallon (Draft RI Report). The Draft RI Report noted that to design and evaluate a potential sediment and surface water cleanup action in the North Creek Tributary, additional soil and sediment data are needed within and adjacent to the North Creek Tributary. These data will be used to evaluate cleanup alternatives and the potential for recontamination.

Additional data needs include the following:

- Toxicity characteristic leaching procedure analysis of stream sediments to evaluate the potential for dangerous waste and to estimate disposal costs;

- Synthetic Precipitation Leachate Procedure (SPLP) analysis of shallow soil adjacent to the creek to evaluate the potential for metals leaching in soil;
- Hydraulic modeling using the U.S. Environmental Protection Agency (EPA) Stormwater Management Model to evaluate discharge and flow rates within the creek; and
- Shallow groundwater monitoring adjacent to the creek to determine whether lead from shot deposited adjacent to the North Creek Tributary could potentially migrate to sediment and surface water via groundwater migration during heavy rain events.

SCOPE OF WORK

The Data Gap Investigation will be implemented over the next several months using sampling methods established in the *Revised Remedial Investigation/Feasibility Study Work Plan Addendum No. 2, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington* dated July 5, 2018, prepared by Farallon; and the *Revised Sampling and Analysis Plan No. 2, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington* dated July 5, 2018, prepared by Farallon (Revised SAP) and provided in Attachment 1.

The scope of work for the Data Gap Investigation includes:

- Advancing borings to collect soil samples to characterize the nature and extent of carcinogenic polycyclic aromatic hydrocarbons (cPAHs), lead, arsenic, and/or antimony detected in soil at concentrations exceeding applicable screening levels established in the RI/FS Work Plan;
- Potentially installing and collecting shallow groundwater samples from shallow monitoring wells in the area adjacent to the North Creek Tributary;
- Collecting additional sediment samples to delineate the extent of metals exceedances and to determine whether metal concentrations occur at characteristic dangerous waste levels as defined by Section 090 of Chapter 173-303 of WAC 173-303-090; and
- Conducting hydraulic modeling to support development of remedial action alternatives.

SOIL SAMPLING – METALS

Farallon will collect up to 20 soil samples from borings near North Creek Tributary, in areas where lead shot has been observed, to evaluate the potential for recontamination. Soil samples will be collected from shallow borings (i.e., depths less than 5 feet below ground surface [bgs]) advanced by hand auger, as shown on Figure 2. Soil samples will be collected at 1-foot intervals, starting from 0 to 1 foot bgs until refusal or 5 feet bgs. Soil samples will be analyzed for one or more of the following:

- Arsenic, antimony, and lead by EPA Method 6010D;
- Arsenic, antimony, and lead using SPLP, followed by EPA Method 1312/6010D; and
- cPAHs by EPA Method 8270E/selective ion monitoring.

Total metals will be analyzed in the 1- and 2-foot samples. Deeper samples will be analyzed for total metals if overlying samples exceed screening levels. If concentrations exceed screening levels, at least one sample from each boring will be selected for SPLP analysis to evaluate whether metals in surface soil and duff are potentially leaching into shallow groundwater. One sample will be analyzed for cPAHs in each boring. Soil samples will be collected, homogenized, containerized, and transported to the laboratory in accordance with the Revised SAP.

MONITORING WELL INSTALLATION

Following a review of the observations and analytical results of the shallow soil sampling described above, Farallon will potentially install up to three shallow monitoring wells in the forest west-adjacent to the North Creek Tributary. The wells will be installed if the SPLP analysis indicates potential for metals to leach into groundwater and potentially recontaminate sediment and surface water in the North Creek Tributary.

If shallow monitoring wells are determined to be necessary, Farallon will contract with a Washington State licensed provider of drilling services to install the wells. The total depths of the monitoring wells are expected to be less than 10 feet bgs; therefore, a surface well monument is not required, and the polyvinyl chloride (PVC) casing will extend approximately 3 feet above ground surface so monitoring wells can be located easily. Monitoring well locations will be confirmed with Ecology prior to field activities.

The groundwater elevations will be evaluated by installing submersible data loggers consisting of pressure transducers with electronic data recorders in a single housing in each monitoring well. Data will be downloaded by a Farallon Scientist following a heavy precipitation event and at the end of the rainy season in May 2021. It is anticipated that the monitoring will be conducted through May 2022.

SEDIMENT SAMPLING – NORTH CREEK TRIBUTARY

Surface sediment samples will be collected from 10 locations shown on Figure 3 to refine the lateral extent zone of sediment with metals concentrations exceeding applicable screening levels in the North Creek Tributary and to evaluate the potential that the sediment would designate as dangerous waste under WAC 173-303 for handling and disposal purposes. Farallon will collect samples from 0 to 1 foot bgs, from three transects and one upstream location, as shown on Figure 3. Sediment samples will be collected, homogenized, containerized, and transported to the laboratory in accordance with the Revised SAP.

Sediment samples will be analyzed for the following:

- Arsenic and lead by EPA Method 6010D; and
- Carcinogenic polycyclic aromatic hydrocarbons by EPA Method 8270E/selective ion monitoring.

The three samples with the highest metals concentrations also will be analyzed for arsenic and lead using the toxicity characteristic leaching procedure, followed by EPA Method 1311. If metals are detected at concentrations exceeding Washington State Dangerous Waste Toxicity Characteristic Maximum Concentrations in WAC 173-303-090, additional samples may be analyzed.

STAFF GAUGE INSTALLATION

A staff gauge and submersible data logger will be installed in the North Creek Tributary to monitor water levels throughout the winter to determine how the levels fluctuate and to allow for response to precipitation and snow events during the rainy season.

Farallon staff will drive two metal fence posts into the North Creek Tributary creek bed and secure a perforated PVC pipe to the posts. A data logger will be placed in the PVC pipe to monitor creek levels. In conjunction with the well monitoring, a Farallon Field Scientist will download the data as follows:

- Following a heavy precipitation event;
- At the end of the rainy season in May 2021; and
- Periodically in the fall and winter of 2021 through May 2022.

QUALITY CONTROL SAMPLES

Field quality control samples will be collected in accordance with the methods described in the Revised SAP and evaluated in accordance with the *Quality Assurance Project Plan, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington* dated August 30, 2016, prepared by Farallon as Appendix C to the RI/FS Work Plan.

SCHEDULE

The staff gauge will be installed in early 2021, and soil sampling and monitoring well installation will be completed in January and February 2021. Sediment samples from the North Creek Tributary will be collected during the spring when little or no water is flowing through the North Creek Tributary.

CLOSING

Please contact either of the undersigned at (425) 295-0800 if you have questions or need additional information.

Sincerely,

Farallon Consulting, L.L.C.

Philip R. Cordell, L.G.
Senior Geologist

Paul Grabau, L.G., L.H.G.
Principal Hydrogeologist

Attachments: Figure 1, *Site Vicinity Map*
Figure 2, *Metals Results and Proposed Soil Sampling Locations*
Figure 3, *Sediment Metals Results and Proposed Sampling Locations*
Attachment 1, Revised Sampling and Analysis Plan No. 2

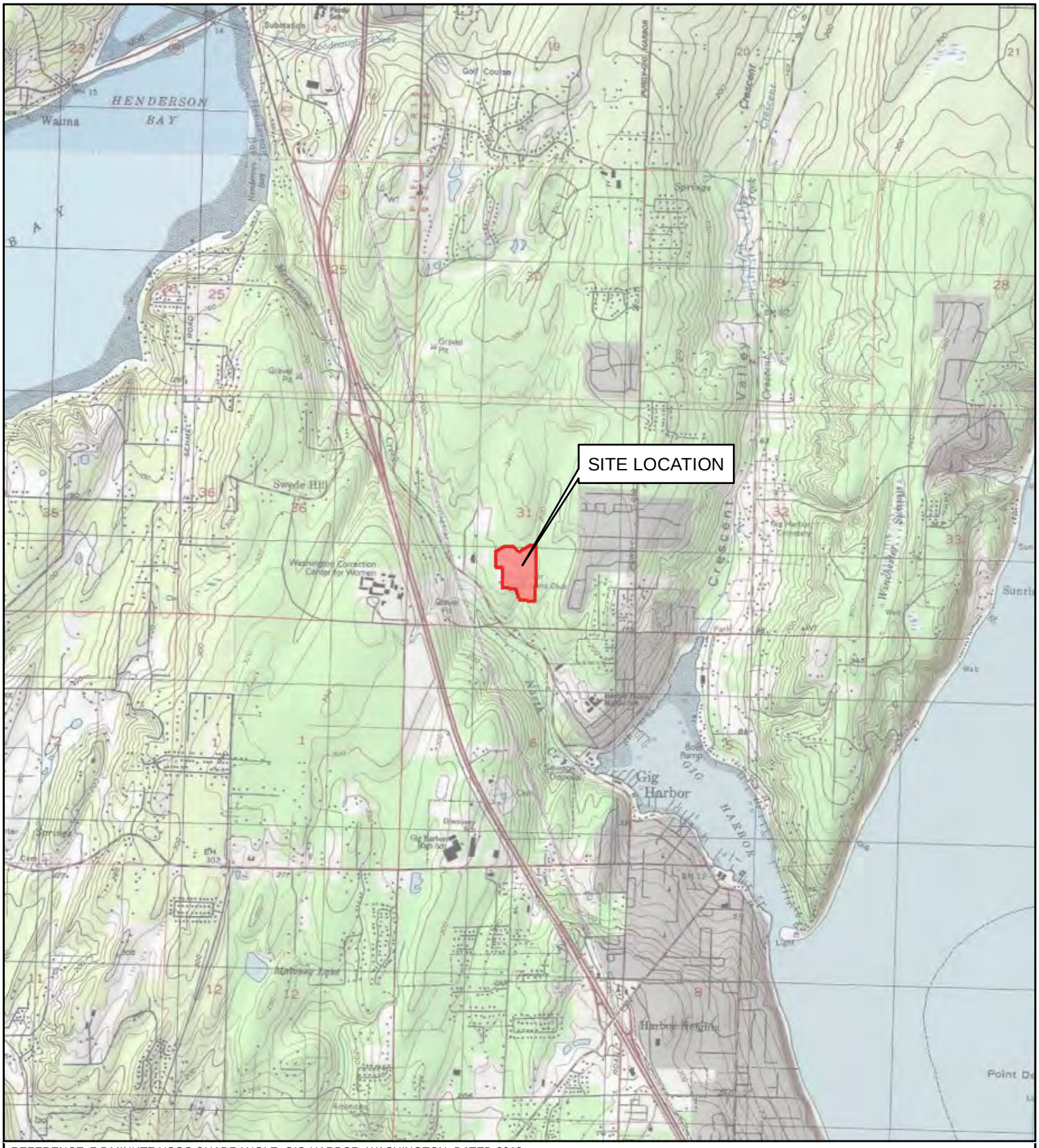
cc: Le Rodenberg, Gig Harbor Sportsman's Club
Clark Davis, Davis Law Office, PLLC

PC/PG:sw

FIGURES

DATA GAP INVESTIGATION ADDENDUM TO THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
Gig Harbor Sportsman's Club
9721 Burnham Drive Northwest
Gig Harbor, Washington

Farallon PN: 1303-001



REFERENCE: 7.5 MINUTE USGS QUADRANGLE GIG HARBOR, WASHINGTON, DATED 2013

0 3,000
SCALE IN FEET

N

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FIGURE 1

SITE VICINITY MAP
GIG HARBOR SPORTMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON

FARALLON PN: 1303-001

Drawn By: tperrin Checked By: PC Date: 12/15/2020 Disc Reference:

Path: Q:\Projects\1303 GigHarbor\Mapfiles\2020_12 RI\Figure-01_SiteVicinityMap_1303001.mxd

FB-01
0.0 ' | --- | <14 | 17
0.5 ' | --- | <13 | 14
0.5 ' | --- | <13 | 14

FB-03
0.0 ' | --- | 17 | 72
0.5 ' | --- | <13 | 25
3.7 ' | --- | <11 | <5.7

STORMWATER DETENTION PONDS

NORTH CREEK TRIBUTARY

HB-22

HB-21

HB-23

FB-04
0.0 ' | --- | <20 | 100
0.5 ' | --- | <11 | <5.6
3.7 ' | --- | <11 | <5.7

FB-02
0.0 ' | --- | 16 | 130
0.5 ' | --- | 15 | 230
3.6 ' | --- | <11 | <5.4

HB-20

HB-24

FB-42

FB-43

SD-10

HB-19

FB-44

HARBOR HILL DRIVE

FB-09
0.0 ' | --- | <13 | 11

FB-05
0.0 ' | --- | <12 | 9.3
0.5 ' | --- | <11 | 14
2.8 ' | --- | <14 | 7.3

FB-08
0.0 ' | --- | <14 | 34
0.5 ' | --- | <14 | 37
0.5 ' | --- | <14 | 27

HB-25

FB-45

HB-26

HB-27

FB-47
0.0 ' | 0.88 | 5.8 | 52
0.5 ' | <0.72 | 7.1 | 11

FB-46

FB-07
0.0 ' | --- | <12 | 31
0.5 ' | --- | <11 | 12

0.00%

0.00%

0.00%

FB-06
0.0 ' | **40** | <16 | **2,400**
0.5 ' | **2,100** | **22** | **4,000**
3.6 ' | <6.0 | <12 | 14

HB-18

FB-10
0.5 ' | **170** | <11 | **10,000**
3.3 ' | <5.5 | <11 | <5.5

0.63%

0.43%

0.84%

STORMWATER POND

FB-11
0.0 ' | --- | <12 | 83
0.5 ' | --- | <12 | 52
3.4 ' | --- | <11 | <5.5

FB-13
0.0 ' | --- | <13 | 96
0.5 ' | --- | <12 | 29

FB-15
0.0 ' | 13 | <13 | **1,800**
0.5 ' | 7.2 | <13 | **620**
3.8 ' | --- | <12 | <5.9

FB-16
0.0 ' | --- | <12 | <6.2

0.74%

0.54%

0.82%

FB-52
0.5' | **1,600** | **300** | **47,000**
0.5' | **3,900** | **940** | **58,000**
1.0' | <5.6 | <11 | 37
1.0' | 6.8 | <12 | **320**
2.0' | <5.5 | <11 | 7.0
2.0' | <5.6 | <11 | 54
3.0' | **1,200** | **250** | **22,000**
3.0' | **1,000** | **140** | **29,000**

D

FB-12
0.5 ' | 7.6 | <11 | **680**
3.5 ' | --- | <11 | <5.4

3.79%

0.92%

0.70%

FB-14
0.0 ' | --- | <12 | 56
0.5 ' | --- | <11 | 27

HB-1

FB-17
0.5 ' | 9.9 | <11 | **860**
3.9 ' | --- | <11 | <5.6

FB-18
0.5 ' | 17 | <11 | **530**
3.8 ' | --- | <11 | <5.5

RIFLE AND PISTOL RANGE

FB-19
0.5 ' | **49** | <11 | **1,500**
2.9 ' | <5.5 | <11 | <5.5

1.99%

0.92%

0.88%

SD-9

HB-2

FB-20
0.5 ' | --- | <11 | 89
0.5 ' | --- | <11 | 96

FB-21
0.5 ' | 5.7 | <11 | **14,000**
0.5 ' | --- | <11 | 140
3.8 ' | --- | <11 | <5.4

MW-01
0.0 ' | 13 | <12 | **800**
0.0 ' | --- | 13 | **700**
0.5 ' | --- | <11 | 73
50.0 ' | --- | <11 | <5.5

NORTH CREEK TRIBUTARY

4.54%

1.87%

1.05%

SD-11

FB-25
0.0 ' | --- | <12 | 65

HB-3

FB-22
0.0 ' | --- | <12 | 47
0.5 ' | --- | <13 | 43
3.0 ' | --- | <11 | <5.7

HARBOR HILL DRIVE

FB-23
0.0 ' | --- | <14 | 79
0.0 ' | --- | <13 | 32
0.5 ' | --- | <13 | 94

FB-24
0.5 ' | --- | <12 | 55
1.0 ' | --- | <11 | 90

FB-54

18.93%

4.73%

0.45%

FB-51
0.5' | **5,500** | **740** | **61,000**
1.0' | **71** | **25** | **3,600**
2.0' | **2,900** | **580** | **35,000**
3.0' | **2,300** | **310** | **29,000**

HB-4

HB-11

SHOTGUN RANGE

HB-5

FB-38
0.0 ' | --- | <11 | 74

SHOT CURTAIN

FB-55

SD-12

21.82%

6.14%

0.78%

FB-37
0.0 ' | --- | <11 | 6.1
0.0 ' | --- | <11 | <5.4
0.5 ' | --- | <11 | <5.4

MW-02
0.0 ' | **870** | **71** | **10,000**
0.0 ' | **930** | **310** | **56,000**
0.5 ' | **64**|<12|**870**
1.0 ' | **320** | **270** | **49,000**
4.6 ' | <5.4 | <11 | <5.4
10.0' | <5.4 | <11|<5.4
30.0' |---|<11|<5.6

FB-56

HB-6

HB-12

FB-26

WATER SUPPLY WELL

CLUBHOUSE

FB-27
0.0 ' | --- | <12 | 9.7
0.5 ' | --- | <12 | <5.8
3.7 ' | --- | <11 | <5.3

FB-57

SD-8

20.72%

6.40%

0.75%

HB-7

HB-8

HB-13

FB-28
0.0 ' | 17 | <15 | **370**
0.5 ' | --- | <11 | 12

FB-29
0.5 ' | --- | <11 | 13
1.0 ' | --- | <11 | 11

FB-58

4.16%

4.61%

0.56%

MW-03
0.0 ' | --- | <11 | 13
0.0 ' | --- | <12 | 13
0.5 ' | --- | <12 | 13
45.0 ' | --- | <12 | <5.9

MW-04
0.5 ' | --- | <12 | 30
0.5 ' | --- | <12 | 36
1.0 ' | --- | <12 | <5.9
2.0 ' | --- | <11 | <5.6
50.0 ' | --- | <11 | <5.7

FB-30
0.0 ' | --- | <11 | 16
0.5 ' | --- | <12 | 62
3.7 ' | --- | <11 | <5.5

E

FB-31
0.0 ' | --- | <13 | 58
0.5 ' | --- | <11 | <5.6

FB-39

SD-13

14.88%

1.42%

0.00%

FB-36
0.0 ' | --- | <11 | <5.4
0.5 ' | --- | <11 | <5.4

HB-14/ 14D

FB-59

FB-50
0.5' | **140** | **55** | **9,500**
1.0' | <5.7 | <11 | 97
2.0' | <5.5 | <11 | 8.1
3.0' | **1,100** | **190** | **23,000**

HB-15

FB-48

FB-49

HB-16

FB-32
0.0 ' | --- | <13 | 29
0.5 ' | --- | <11 | 6.6

1.31%

0.84%

0.00%

SD-14

FB-33
0.0 ' | --- | <12 | 8.5

FB-53

HB-17

0.64%

0.00%

BURNHAM DRIVE NORTHWEST

SD-2

SD-1

0.57%

FB-40

FB-41

FS-NCS-1

SD-7

FS-NCS-2

SD-6

FB-34
0.5 ' | --- | <12 | <6.0

FB-35
0.0 ' | --- | <13 | 15
0.5 ' | --- | <12 | 10

FS-NCS-3

FS-NCS-5

FS-NCS-4

SD-15

SD-16

97th STREET NORTHWEST

N

0 80 160

SCALE IN FEET

LEGEND

- PROPOSED STAFF GAUGE
- PROPOSED SHALLOW SOIL BORING
- MONITORING WELL
- BORING
- BACKGROUND BORING
- SOIL SAMPLE LOCATION (HWA)
- SEDIMENT SAMPLE (FARALLON)
- HISTORICAL SEDIMENT SAMPLE (FLOYD/SNIDER 2014)
- STREAM
- INTERMITTENT STREAM
- PRELIMINARY HABITAT AREAS DESIGNATED BY ECOLOGY
- SITE BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARY
- A / 1 — FIELD SCREENING GRID (100' x 100') AND GRID IDENTIFIER

SOIL SAMPLE ANALYTICAL RESULT =
DEPTH FEET BGS | ANTIMONY | ARSENIC | LEAD
SOIL AND SEDIMENT RESULTS IN MILLIGRAMS PER KILOGRAM

21.82%	=	PERCENTAGE OF BULK SOIL SAMPLE COMPRISING LEAD SHOT
BOLD	=	CONCENTRATIONS EXCEED MTCA METHOD A CLEANUP LEVEL
<	=	SOIL SAMPLE CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
---	=	SAMPLE NOT ANALYZED
BGS	=	BELOW GROUND SURFACE
TBD	=	TO BE DETERMINED
MTCA	=	WASHINGTON STATE DEPARTMENT OF ECOLOGY MODEL TOXICS CONTROL ACT CLEANUP REGULATION

RED	WEIGHT PERCENT > 10%
ORANGE	WEIGHT PERCENT 3 TO 10%
YELLOW	WEIGHT PERCENT 1 TO 3%
GREEN	WEIGHT PERCENT <1%

DRAFT

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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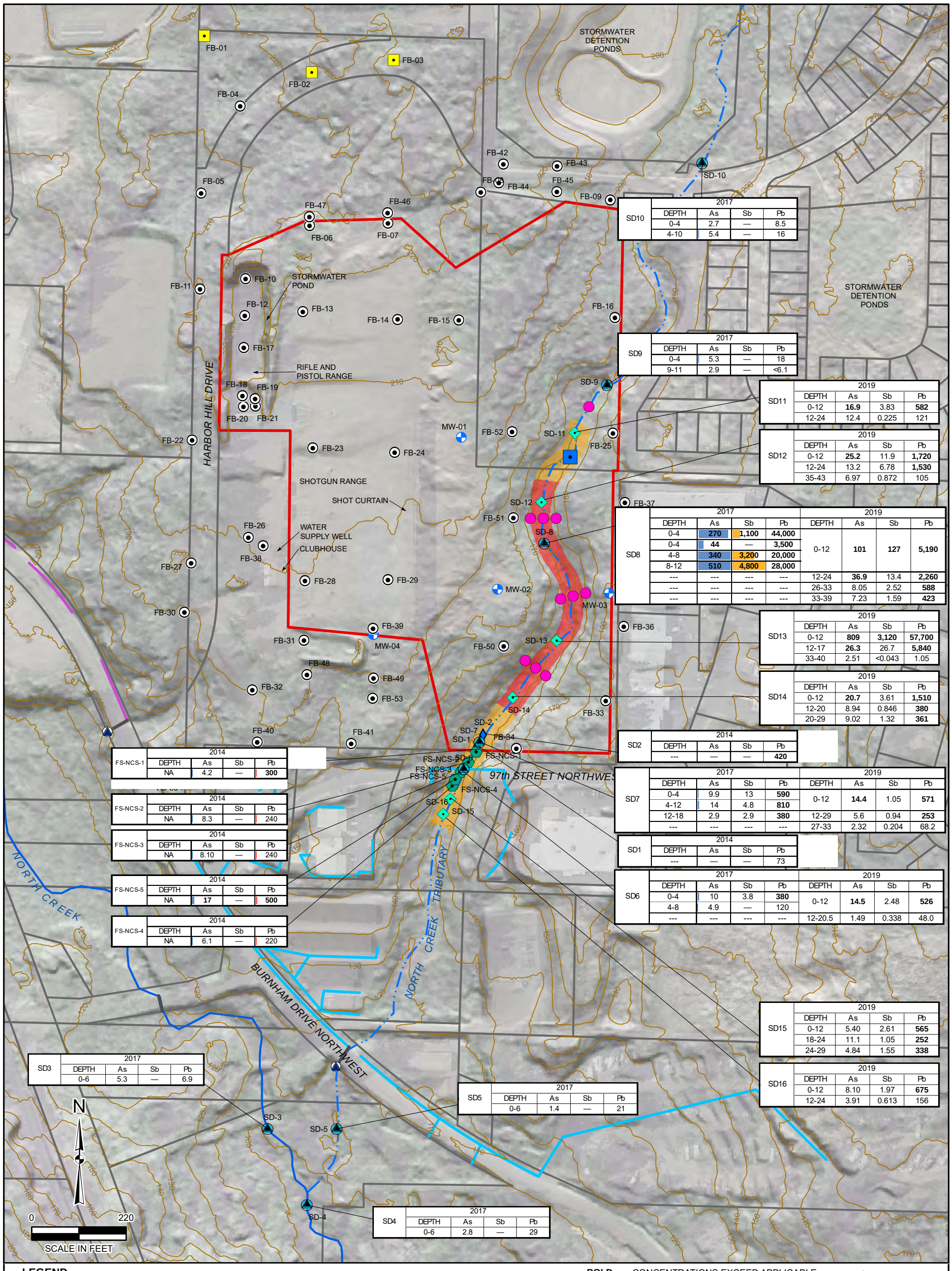
FIGURE 2

METALS RESULTS AND
PROPOSED SOIL SAMPLING LOCATIONS
GIG HARBOR SPORTMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON

FARALLON PN: 1303-001

Drawn By: tperrin | Checked By: PC | Date: 12/18/2020 | Disc Reference:

Document Path: Q:\Projects\1303 GigHarbor\Mapfiles\2020_12 RI\Figure-02_LeadSampling_Proposed.mxd



SD10	2017			
	DEPTH	As	Sb	Pb
	0-4	2.7	—	8.5
	4-10	5.4	—	16

SD9	2017			
	DEPTH	As	Sb	Pb
	0-4	5.3	—	18
	9-11	2.9	—	<6.1

SD11	2019			
	DEPTH	As	Sb	Pb
	0-12	**16.9**	3.83	**582**
	12-24	12.4	0.225	121

SD12	2019			
	DEPTH	As	Sb	Pb
	0-12	**25.2**	11.9	**1,720**
	12-24	13.2	6.78	**1,530**
	35-43	6.97	0.872	105

SD8	2017				2019			
	DEPTH	As	Sb	Pb	DEPTH	As	Sb	Pb
	0-4	**270**	**1,100**	**44,000**	0-12	**101**	**127**	**5,190**
	0-4	**44**	—	**3,500**				
	4-8	**340**	**3,200**	**20,000**				
	8-12	**510**	**4,800**	**28,000**				
	---	---	---	---	12-24	**36.9**	13.4	**2,260**
	---	---	---	---	26-33	8.05	2.52	**588**
	---	---	---	---	33-39	7.23	1.59	**423**

SD13	2019			
	DEPTH	As	Sb	Pb
	0-12	**809**	**3,120**	**57,700**
	12-17	**26.3**	26.7	**5,840**
	33-40	2.51	<0.043	1.05

SD14	2019			
	DEPTH	As	Sb	Pb
	0-12	**20.7**	3.61	**1,510**
	12-20	8.94	0.846	**380**
	20-29	9.02	1.32	**361**

SD2	2014			
	DEPTH	As	Sb	Pb
	---	—	—	**420**

SD7	2017				2019			
	DEPTH	As	Sb	Pb	DEPTH	As	Sb	Pb
	0-4	9.9	13	**590**	0-12	**14.4**	1.05	**571**
	4-12	14	4.8	**810**				
	12-18	2.9	2.9	**380**	12-29	5.6	0.94	**253**
	---	---	---	---	27-33	2.32	0.204	68.2

SD1	2014			
	DEPTH	As	Sb	Pb
	---	—	—	73

SD6	2017				2019			
	DEPTH	As	Sb	Pb	DEPTH	As	Sb	Pb
	0-4	10	3.8	**380**	0-12	**14.5**	2.48	**526**
	4-8	4.9	—	120				
	---	---	---	---	12-20.5	1.49	0.338	48.0

SD15	2019			
	DEPTH	As	Sb	Pb
	0-12	5.40	2.61	**565**
	18-24	11.1	1.05	**252**
	24-29	4.84	1.55	**338**

SD16	2019			
	DEPTH	As	Sb	Pb
	0-12	8.10	1.97	**675**
	12-24	3.91	0.613	156

FS-NCS-1	2014			
	DEPTH	As	Sb	Pb
	NA	4.2	—	**300**

FS-NCS-2	2014			
	DEPTH	As	Sb	Pb
	NA	8.3	—	240

FS-NCS-3	2014			
	DEPTH	As	Sb	Pb
	NA	8.10	—	240

FS-NCS-5	2014			
	DEPTH	As	Sb	Pb
	NA	**17**	—	**500**

FS-NCS-4	2014			
	DEPTH	As	Sb	Pb
	NA	6.1	—	220

SD3	2017			
	DEPTH	As	Sb	Pb
	0-6	5.3	—	6.9

SD5	2017			
	DEPTH	As	Sb	Pb
	0-6	1.4	—	21

SD4	2017			
	DEPTH	As	Sb	Pb
	0-6	2.8	—	29

LEGEND

- PROPOSED 2021 SEDIMENT SAMPLE
- MONITORING WELL
- BORING
- BACKGROUND BORING
- SEDIMENT SAMPLE (FARALLON 2018)
- SEDIMENT SAMPLE (FARALLON 2017)
- SEDIMENT SAMPLE (FARALLON 2014)
- HISTORICAL SEDIMENT SAMPLE (FLOYD/SNIDER 2014)
- OUTFALL
- STORM DITCH
- CONVEYANCE PIPING
- CULVERT
- STREAM
- INTERMITTENT STREAM
- 100 TOPOGRAPHIC CONTOURS
- SITE BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARY
- PROPOSED STAFF GAUGE

COLOR BOXES INDICATE RELATIVE CONCENTRATIONS BETWEEN SAMPLE LOCATIONS. DEPTHS REPORTED IN INCHES. CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg)

- LEAD CONCENTRATIONS > 500 mg/kg (? INFERRED)
- LEAD CONCENTRATIONS > 1,000 mg/kg

BOLD = CONCENTRATIONS EXCEED APPLICABLE SOIL, SEDIMENT, OR SURFACE WATER SCREENING LEVELS
< = SAMPLE CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
--- = SAMPLE NOT ANALYZED
BGS = BELOW GROUND SURFACE
ALL LOCATIONS ARE APPROXIMATE.FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

As = ARSENIC
Sb = ANTIMONY
pb = LEAD

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FIGURE 3

SEDIMENT METALS RESULTS AND PROPOSED SAMPLING LOCATIONS
GIG HARBOR SPORTMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON

FARALLON PN: 1303-001

Drawn By: tperrin | Checked By: PC | Date: 12/18/2020 | Disc Reference: Q:\Projects\1303 GigHarbor\Mapfiles\2020_12 RI\Figure-03_MetalsResusts_PropSedSamples.mxd

ATTACHMENT 1
REVISED SAMPLING AND ANALYSIS PLAN NO. 2

DATA GAP INVESTIGATION ADDENDUM TO THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN

Gig Harbor Sportsman's Club
9721 Burnham Drive Northwest
Gig Harbor, Washington

Farallon PN: 1303-001

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Washington
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Portland | Bend | Baker City
California
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REVISED SAMPLING AND ANALYSIS PLAN NO. 2

GIG HARBOR SPORTSMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON
FACILITY SITE IDENTIFICATION NO. 2566095
AGREED ORDER NO. DE 12803

Submitted by:
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Farallon PN: 1303-001

For:
Washington State Department of Ecology
Toxics Cleanup Program
PO Box 47775
Olympia, Washington 98504-7775

On Behalf of:
Gig Harbor Sportsman's Club
c/o Mr. Clark Davis
Davis Law Office, PLLC
7525 Pioneer Way, Suite 101
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July 5, 2018

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FIGURES

1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this Revised Sampling and Analysis Plan No. 2 (Revised SAP) on behalf of the Gig Harbor Sportsman's Club (GHSC) in accordance with the requirements of Agreed Order No. DE 12803 entered into by GHSC and the Washington State Department of Ecology (Ecology) in November 2015, and in accordance with the Washington State Model Toxics Control Act Cleanup Regulation, as established in Chapter 173-340 of the Washington Administrative Code (WAC 173-340). This Revised SAP was prepared to incorporate additional scope items into the Remedial Investigation (RI) that were directed by the Ecology Site Manager, Mr. Matthew Morris, via emails and conference calls between September 2017 and February 2018 and in the letter regarding Remedial Investigation/Feasibility Study Work Plan Addendum No. 2 dated May 23, 2018, from Mr. Morris of Ecology to Ms. Jennifer L. Moore of Farallon (Ecology 2018), as described in the letter regarding Revised Remedial Investigation/Feasibility Study Work Plan Addendum No. 2, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington dated July 5, 2018, from Ms. Moore and Mr. Peter Jewett of Farallon to Mr. Morris of Ecology (Farallon 2018) (Revised RI/FS Work Plan Addendum No. 2). The Revised RI/FS Work Plan Addendum No. 2 is an addendum to the *Final Remedial Investigation/Feasibility Study Work Plan, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington* dated August 30, 2016, prepared by Farallon (2016a) (RI/FS Work Plan). Sampling conducted under this Revised SAP will also be conducted in accordance with the Washington State Sediment Management Standards, as established in WAC 173-204.

The purpose of the Revised SAP is to provide details pertaining to surface water, soil, sediment, and pore water sampling and analysis for the scope of work presented in the Revised RI/FS Work Plan Addendum No. 2, to be conducted at the GHSC property at 9721 Burnham Drive Northwest in Gig Harbor, Washington (herein referred to as the GHSC Property) (Figure 1). The Revised SAP meets the requirements for a Sampling and Analysis Plan as defined in WAC-173-340-820 and WAC 173-204-600. The scope of the RI is discussed further in the RI/FS Work Plan and in the Revised RI/FS Work Plan Addendum No 2. This Revised SAP summarizes the standards and procedures to be followed for surface water, soil, sediment, and pore water sample collection and analysis, and field quality control. Quality assurance and quality control (QA/QC) procedures and samples discussed in this Revised SAP are further detailed in the Quality Assurance Project Plan provided in Appendix C of the RI/FS Work Plan.

2.0 BACKGROUND

The GHSC Property includes an outdoor open firing range, shooting berms, a clubhouse, and a storage building constructed in 1950 (Pierce County Assessor-Treasurer's Office 2015). GHSC recently sold a portion of its property to the City of Gig Harbor for the Harbor Hill expansion project, which will connect Harbor Hill Drive and Burnham Drive Northwest by constructing a roadway across the former northern and western portions of the GHSC Property. The GHSC Property now comprises approximately 30.38 acres on Pierce County Parcel Nos. 222313073 and 0222314016 (Figure 2). The GHSC Property primarily is wooded, with the exceptions of an open grass field that comprises the shotgun firing range (shotgun range), buildings, and a bermed firing range for the use of rifles and pistols (rifle and pistol range) on the central and western portions of the GHSC Property. The use of the surrounding area is mixed commercial and residential. GHSC has been in operation since 1947.

An unnamed intermittent stream (herein referred to as the North Creek Tributary) traverses the eastern portion of the GHSC Property (Figure 2). The North Creek Tributary flows into North Creek, south of the GHSC Property. North Creek is a perennial salmon-bearing stream that flows to Gig Harbor in Puget Sound (Ecology 2008).

Current and historical operation on the GHSC Property may have resulted in releases to the environment of hazardous substances, including metals from shot, bullets, and bullet jackets and polycyclic aromatic hydrocarbons (PAHs) from commonly used clay targets.

Farallon conducted field sampling activities between January 2017 and June 2018 in accordance with the RI/FS Work Plan and the letter regarding Remedial Investigation Work Plan Addendum, Gig Harbor Sportsman's Club, 9721 Burnham Drive Northwest, Gig Harbor, Washington dated December 22, 2016, from Ms. Moore and Mr. Jewett of Farallon to Mr. Morris of Ecology (Farallon 2016b). Additional subsurface investigation activities were conducted on the western and northeastern portions of the GHSC Property by HWA Geosciences Inc. between April and June 2017 to support the Harbor Hill expansion project being conducted by the City of Gig Harbor proximate to the northern and western portions of the GHSC Property.

Results of RI field activities conducted through October 2017 and the HWA Geosciences Inc. subsurface investigation activities conducted between April and June 2017 indicated the presence of total naphthalenes and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in soil on the GHSC Property at concentrations exceeding the screening levels established in the RI/FS Work Plan (Figure 2).

Arsenic, antimony, and lead were detected at concentrations exceeding screening levels in soil on the GHSC Property (Figure 3). Arsenic, antimony, and lead were detected at concentrations exceeding screening levels in sediments in the North Creek Tributary on the southeastern portion of the GHSC Property, and downstream of the GHSC Property proximate to the right-of-way of 97th Street Northwest (Figure 3). Farallon observed lead shot in forest duff on the ground surface

and in the stream bed of the North Creek Tributary proximate to sediment sample location SD-8 during sediment sampling activities conducted in September 2017.

The nature and extent of these hazardous substances, which have been identified as the constituents of potential concern (COPCs) for the RI, have not been adequately assessed. The COPCs are further discussed in the RI/FS Work Plan. The purpose of the RI is to characterize the nature and extent of COPCs resulting from current and historical GHSC operations, and to provide sufficient information to conduct a feasibility study to assess technically feasible cleanup alternatives for the GHSC Property.

3.0 SAMPLING PROCEDURES

This section details the sampling standards and procedures that will be applied in conducting the RI, presented below by potential media of concern. Soil and some sediment samples collected as part of the RI will be submitted to OnSite Environmental Inc. of Redmond, Washington under standard chain-of-custody protocols for analysis according to the procedures described below. Some sediment, surface water, and pore water samples will be submitted to ALS Environmental of Kelso, Washington. Sediment samples analyzed for acute and chronic toxic effects will be submitted to Northwestern Aquatic Sciences of Newport, Oregon. Samples will be submitted to the appropriate laboratories under standard chain-of-custody protocols for analysis according to the procedures described below.

An Ecology biologist will conduct a biological assessment of the wooded portions of the GHSC Property as part of a net environmental benefit analysis (NEBA). The purpose of the NEBA is to weigh the ecological costs and benefits of environmental and ecological restoration projects to prevent substantial injury to valuable habitat through the implementation of those projects. The Ecology biologist will evaluate the value of the habitat and make recommendations to the Ecology Site Manager, Mr. Morris, regarding potential boring locations that would complement the NEBA. Farallon will conduct field screening for lead in forest duff and soil on the eastern and southeastern portions of the GHSC Property as a part of the NEBA. These two lines of evidence will inform the selection of boring locations on the eastern and southeastern portions of the GHSC Property to facilitate depth-weighted receptor adjustments to complete the NEBA.

3.1 SOIL SAMPLING AND ANALYSIS – BORINGS

Farallon will engage public and private utility locators to clear proposed boring areas for utilities, and a drilling contractor to advance each boring to a total depth of 5 feet below ground surface (bgs) using direct-push drilling techniques or hand-held tooling, depending on accessibility and drilling conditions. Soil samples will be field screened for evidence of contamination, including odor, the presence of debris related to current and historical GHSC operations, and/or staining.

Shallow samples will be analyzed initially with the deeper samples retained in a sample refrigerator at the analytical laboratory for potential analysis. Deeper soil samples may be analyzed if COPC concentrations in shallow soil samples exceed applicable screening levels for soil as established in the RI/FS Work Plan. Soil samples will be retained at the laboratory until they are no longer needed for analysis or they exceed the holding time specified by the analytical method.

Northwest-Adjacent Property and Southern Right-of-Way of Sentinel Drive

Soil samples will be collected from two borings on the northwest-adjacent property, Pierce County Parcel No. 4003250960, and four borings on the southern right-of-way of Sentinel Drive, northeast of the GHSC Property (Figure 2), to provide lateral delineation of cPAHs in soil as directed by Ecology. The more distant borings in both areas are considered contingency borings that will be advanced in case additional lateral delineation is deemed necessary after the initial set of soil samples have been analyzed. Soil samples for these borings will be collected from the ground

surface and at depths of 0.5, 1.0, 2.0, 3.0, and 5.0 feet bgs consistent with previous scopes of work, which are based on aerial deposition of contaminants of potential concern. Soil samples will be containerized in specially cleaned, laboratory-provided glass sample containers for shipment to the laboratory for analysis as described in Section 3.1.2, Soil Sample Collection and Handling Procedures. Soil samples from the near borings will be analyzed using the vertically tiered approach described above. Similarly, soil samples from corresponding depths will be analyzed from the more distant contingency borings to provide lateral delineation, if needed.

Eastern and Southeastern Portions of the GHSC Property

Soil samples also will be collected from borings in the wooded areas on the eastern and southeastern portions of the GHSC Property to assess soil in these areas for potential metals contamination that could affect water quality and metals concentrations in the sediment of the North Creek Tributary. Collocated soil samples will be collected for cPAH analysis to refine the area impacted by clay targets on these portions of the GHSC Property. Forest duff present in the sampling area will be field screened for the presence of lead shot or clay shooting targets as described in the RI/FS Work Plan. Forest duff thickness at each boring location will be recorded as a positive number above ground surface on the boring log for each boring. Boring locations will be established after the biological assessment and field screening of soil and forest duff have been completed in the early stages of the NEBA.

3.1.1 Soil Sample Identification

The soil samples collected from borings advanced on the northwest-adjacent property, the southern right-of-way of Sentinel Drive, and the eastern and southeastern portions of the GHSC Property will be assigned unique sample identifiers, including the name of the boring, the depth at which the soil sample was collected in feet bgs, and the date the soil sample was collected (i.e., FB1-1.5-010118). The sample identifier will be placed on the sample label, the Field Report form, Sample Summary forms, and the Chain of Custody form.

3.1.2 Soil Sample Collection and Handling Procedures

Soil samples collected from the borings will be collected and handled in accordance with the procedures listed below:

- Clean Visqueen sheeting will be used to prevent sampling equipment and soil cores from contacting the ground surface.
- Soil descriptions will be recorded on boring logs for each boring, including at a minimum: sample depth or elevation, Unified Soil Classification System description, soil moisture, presence of lead shot or clay target fragments, and visual and olfactory indications of potential contamination. Forest duff thickness at each boring location, if present, will be recorded as a positive depth above ground surface on the boring log for each affected boring.
- Soil samples will be collected from the sample liner, split-spoon sampler, or decontaminated hand auger using decontaminated stainless-steel utensils and placed into a

decontaminated stainless-steel mixing bowl for homogenization. Non-dedicated sampling equipment will be decontaminated between uses, as appropriate.

- A representative portion of each soil sample will be spread across a clean sheet of white paper to inspect the soil for debris such as bullets, bullet fragments, metal shot, bullet jackets, and clay target fragments.
- The remaining soil will be placed in the stainless steel bowl and thoroughly homogenized using decontaminated stainless steel utensils until the soil is uniform in texture and color, placed into a specially cleaned laboratory-provided sample container, and stored on ice in a cooler for shipment to the laboratory under standard chain-of-custody protocols.

Soil samples collected for cPAH analysis will be analyzed by U.S. Environmental Protection Agency (EPA) Method 8270D/SIM. Soil samples collected for metals analysis will be analyzed for pH by EPA Method 9045D and for arsenic, antimony, and lead by EPA 6000 Series Methods.

Following evaluation of soil sampling results, an additional phase of investigation may be conducted to evaluate the nature and extent of contamination in soil if the lateral or vertical extent of contamination has not been adequately delineated.

3.2 FIELD SCREENING AND ANALYSIS OF FOREST DUFF AND SOIL FOR NEBA

Farallon will conduct field screening of forest duff and surface soil for lead shot on the eastern and southeastern portions of the GHSC Property as a part of the NEBA. During the field screening, the eastern and southeastern portions of the GHSC Property will be divided into a sampling grid comprising 100- by 100-foot grid spacings (Figure 3). Farallon Field Scientists will collect bulk samples of soil and forest duff from the center of each grid square. Each bulk sample will be weighed on a scale calibrated to the approximate weight of the bulk samples and sieved to recover the component of the bulk sample that was comprised of lead shot. The recovered lead shot will be reweighed on a scale calibrated to accurately read smaller weights. These data will be used to quantify the weight percent of lead shot that was present in the bulk sample.

3.2.1 Field Screening Sample Identification

The bulk forest duff and soil samples collected for field screening from the field screening grid on the eastern and southeastern portions of the GHSC Property will be assigned unique sample identifiers, including the name of the sample grid and the date the sample was collected (i.e., A1-010118 for a bulk sample collected from grid square A1 on January 1, 2018). The sample identifier will be placed on the sample label for the resealable plastic bag, the Field Report form, and the field screening sample summary forms.

3.2.2 Field Screening Sample Collection and Handling Procedures

Bulk forest duff and soil samples collected during the field screening process will be collected and handled in accordance with the procedures listed below:

- Soil descriptions will be recorded on the sample summary form for each evaluated grid square, including at a minimum: Unified Soil Classification System description of the samples, soil moisture, presence of lead shot or clay target fragments, and visual and olfactory indications of potential contamination. Forest duff thickness at each boring location, if present, will be recorded on the Field Report Form.
- Soil samples will be collected directly from the ground surface using decontaminated stainless-steel utensils and placed into a decontaminated 2.5-quart bucket. Any material piled above the top of the bucket will be scraped off with a ruler so that each bulk sample is exactly 2.5 quarts in volume.
- The bulk sample will be transferred from the bucket to a clean resealable gallon-sized plastic bag, labeled, and transported to the sample processing station.
- Each bulk sample will be weighed on a scale calibrated to the approximate weight of the bulk samples.
- Each bulk sample will then be individually processed through a series of sieves to remove coarse gravel and biological material and recover the lead shot. It is not practicable to use a shaking table to sieve the bulk samples, so the material will be washed through the sieves with water.
- After the bulk samples have been processed through the sieve, the lead shot will be recovered and reweighed on a scale calibrated to accurately read smaller weights, to quantify the amount of lead shot that was present in the bulk sample.

3.3 SURFACE WATER SAMPLING AND ANALYSIS

Surface water samples will be collected from sample locations SD-3 through SD-10 and the six new surface water and sediment sample locations shown on Figure 4 during the next first fall flush rain event in the fourth quarter of 2018, a high-flow event in the first quarter of 2019, and a low-flow event in the second or third quarter of 2019. Cations, anions, and other measurements of water chemistry will be collected during each surface water sampling event to allow modeling of the metal toxicity, metal speciation, and the protective effects of competing cations into predictions of metal bioavailability. Toxicity modeling for lead will be conducted using the biotic ligand model in accordance with the methods described in the *Biotic Ligand Model Windows Interface, Research Version 3.16.2.41: User's Guide and Reference Manual* dated November 2017, prepared by WindWard Environmental LLC (2017).

Additional surface water, soil, and sediment samples will be collected where surface water or stormwater enters the creek channels from natural channels observed in the field and from engineered stormwater conveyance systems to refine potential source areas inside and outside of the GHSC Property. If additional surface water, soil, and sediment samples are collected to identify

potential source areas, then those samples will be collected in accordance with the procedures outlined in the following sections of this Revised SAP:

- Surface water samples: Section 3.3, Surface Water Sampling and Analysis;
- Soil samples: Section 3.2, Field Screening and Analysis of Forest Duff and Soil for NEBA; and
- Sediment samples: Section 3.4, Sediment Sampling and Analysis of this Revised SAP.

3.3.1 Surface Water Sample Identification

The surface water samples will be assigned a unique sample identifier, including the name of the sample location, the medium sampled, and the date the sample was collected (e.g., SD-1-SW-010118). The sample identifier will be placed on the sample label, the Field Report form, Sample Summary forms, and the Chain of Custody form.

3.3.2 Surface Water Sample Collection and Handling Procedures

The surface water samples will be collected and handled in accordance with the procedures listed below:

- The samples will be collected by dipping the certified pre-cleaned laboratory-provided sample containers directly into the center of the stream channel flow using a swing sampler.
- Care will be taken not to handle the seal or inside cap of the container when the sample is placed into the containers, and the seals/caps will be secured.
- The sample container will be labeled with the medium (surface water), date, time sampled, sample identification and number, project name, project number, and sampler's initials.
- The sample will be logged on a Chain of Custody form and placed into a chilled cooler for transport to the laboratory under chain-of-custody protocols.
- Disposable sampling and health and safety supplies and equipment will be discarded in an appropriate waste receptacle.
- The depth of the flowing water at each surface water sample location will be measured, staked, and surveyed using a portable global positioning system (GPS) receiver, and plotted on a scaled drawing. Digital photographs of each location will be taken.

Surface water samples will be measured in the field for turbidity, temperature, pH, conductivity, and oxidation/reduction potential using a Yellow Springs Instrument multi-parameter meter during collection of the surface water samples. Surface water flow will be measured at each location using a Global Water FP-101/201 stream flow meter or similar device. Surface water samples submitted for laboratory analysis will include:

- Sulfate by ASTM International Method (ASTM) Method D516-07;
- Chloride by Standard Method (SM) 4500-Cl;

- Alkalinity by EPA Method 310.1;
- Calcium; magnesium; sodium; potassium; and total and dissolved arsenic, antimony, and lead by EPA Methods 200.7 and/or 200.8;
- Hardness by EPA Method 130.2 or SM 2340B;
- Sulfide by EPA Method 376.1;
- Dissolved organic carbon by SM 5310B; and
- Nitrate and nitrite by EPA 300.00 Series Methods.

The results from the surface water sampling will be evaluated; if COPCs are detected at concentrations exceeding preliminary screening levels, an additional phase of investigation will be required to evaluate the nature and extent of contamination in surface water.

3.4 SEDIMENT SAMPLING AND ANALYSIS

Sediment samples will be collected from the creek bed of the North Creek Tributary and the base of the stormwater pond on the northwestern portion of the GHSC Property (Figure 3) in accordance with the guidance provided in the *Sediment Cleanup User's Manual II* dated March 2015 and revised in December 2017, prepared by Ecology (2015). Sediment samples will be collected from four new locations along the North Creek Tributary on the eastern and southeastern portions of the GHSC property; two new locations along the North Creek Tributary, proximate to the bridge on 97th Street Northwest that crosses the North Creek Tributary, south of the GHSC Property; and one new location at the base of the stormwater pond on the northwestern portion of the GHSC Property (Figure 4). Previous sediment sample locations SD-6 through SD-9 will be resampled as a part of the proposed sediment sampling event to provide a temporal profile along the stream. Farallon will advance sediment cores that extend deeper than previous coring at existing sediment sample locations SD-7 and SD-8 to vertically delineate metals concentrations detected at these sample locations. Note that it is possible that this coring will extend beyond the sediment boundary into the underlying soil depending on the sediment thickness at these sample locations. Additional sediment samples will be collected where surface water or stormwater enters the creek via natural channels or engineered conveyance systems to refine potential source areas for detections of contaminants in sediment samples collected from within the creek channels.

The sediment samples will be collected proximate to the corresponding surface water samples using a sediment hand-corer with a Lexan sample liner or a decontaminated stainless steel trowel as described in Section 3.3.2, Sediment Sample Collection and Handling Procedures.

3.4.1 Sediment Sample Identification

The sediment samples will be assigned a unique sample identifier, including the name of the sample location, the medium sampled, the depth interval at which the sediment sample was collected in inches bgs, and the date the sediment sample was collected (e.g., SD1-SS-0-6-010118). Sample media include surface sediment (SS), which consists of grab surface sediment

samples obtained using a decontaminated stainless steel trowel when the stream bed is dry, and sediment cores (SC), which will be collected using a sediment hand-corer with a Lexan liner when overlying water is present. If coring at sediment sample locations SD-7 and SD-8 extend into the soil, then soil nomenclature discussed in Section 3.1.1, Soil Sample Identification, will be used to identify those samples. The sample identifier will be placed on the sample label, the Field Report form, Sample Summary forms, and the Chain of Custody form.

3.4.2 Sediment Sample Collection and Handling Procedures

The sediment samples collected from the creek bed of the North Creek Tributary will be collected and handled in accordance with the procedures listed below:

- Sediment samples will be collected during low-flow or dry conditions if possible, but not so long after a rainfall that the streambed and surrounding soil cannot be differentiated.
- If there is overlying water at the sample location, sediment samples will be collected using a sediment hand-corer and the water will be carefully siphoned off the top of the sediment sample immediately after collection, taking care to not lose any overlying fine-grained material.
- If there is no overlying water at the sample location (e.g., intermittent stream locations), sediment samples will be collected using a stainless steel trowel.
- Lithological information will be logged during each sampling event, including at a minimum: sample depth or elevation, Unified Soil Classification System description, presence of debris and/or organisms, sediment moisture, and visual and olfactory indications of potential contamination.
- The samples will be collected from the sample liner or decontaminated stainless steel sampling tip using decontaminated stainless steel utensils, placed into a decontaminated stainless steel mixing bowl, and thoroughly homogenized until the matrix is uniform in texture and color prior to being placed in specially cleaned laboratory-provided sample containers. Reusable non-dedicated sampling equipment will be decontaminated between uses, as appropriate.
- The homogenized sample will be placed into certified pre-cleaned laboratory-provided sample jars for the specified analyses.
- Care will be taken not to handle the seal or inside cap of the jar when the sample is placed into the sample containers, and the seals/caps will be secured.
- The sample jar will be labeled with the medium (sediment), date, time sampled, sample identification, project name, project number, and sampler's initials.
- The sample will be logged on a Chain of Custody form and placed into a chilled cooler for transport to the laboratory under standard chain-of-custody protocols.

- Disposable sampling and health and safety supplies and equipment will be discarded in an appropriate waste receptacle.
- The location of each sediment sample will be staked, surveyed using a GPS receiver, and plotted on a scaled drawing. Digital photographs of each location will be taken.

If the sediment sample location consists of a rocky streambed, Farallon Field Scientists will search for natural depositional areas to sample where finer-grained sediments have settled as those sediments will contain the highest concentrations of contaminants, and may also be areas where shot has come to rest. If there is any standing water, appropriate sampling procedures and equipment will be used to ensure that an intact sample is collected and that surface fines are not washed away. If there are no areas without mixed rocks and fines, Farallon Field Scientists will select sampling locations that appear to contain the highest ratio of fines to mixed rocks in the vicinity of the planned sample locations.

If the sampling location is not easily distinguished from the surrounding soil and/or has deep sediments, the total sampling depth will be selected based on the following:

- Depth of any organisms observed;
- Depth of plant roots observed; and
- Depth of obvious changes in the soil (e.g., horizons, soil types, anaerobic versus aerobic).

An initial test pit may be hand-dug proximate to each planned sediment sampling location to determine the total sediment sample depth based on the depth of the biologically active zone and soil layers observed in the test pit, with the rationale recorded in the field notebook. Multiple layers will be collected for analysis as practicable at each sediment sampling location.

Sediment samples from the North Creek Tributary will be analyzed for the following:

- Arsenic, antimony, and lead by EPA 6000 Series Methods;
- Simultaneously extracted metals (including cadmium, copper, lead, nickel, and zinc) and acid volatile sulfides by EPA Method EPA-821-R-91-100;
- Total organic carbon by EPA Method 9060A; and
- Particle-size distribution by Puget Sound Estuary Protocols (EPA – Region 10 1996) and/or ASTM Method D422.

Additional sediment samples will be collected and analyzed for acute and chronic toxic effects on aquatic life from three sample locations that are anticipated to span the range of elevated lead concentrations exceeding the sediment cleanup objective of 360 milligrams per kilogram (i.e., downrange of the four most commonly used shooting stations on the shotgun range) (Figure 3). The Sediment Management Standards, as set forth in WAC 173-204-563(3)(d), require testing with three endpoints, including acute and chronic toxicity testing and one non-lethal endpoint such as organism growth. Sediment samples for toxicity testing will be analyzed as follows.

Acute Effects

- Hyalella azteca: 10-day mortality by ASTM Method E1706-05 (2010) and/or EPA Method 100.1;
- Chironomus dilutus: 10-day mortality by ASTM Method E1706-05 (2010) and/or EPA Method 100.2; and
- Chironomus dilutus: 10-day growth by ASTM Method E1706-05 (2010) and/or EPA Method 100.2.

Chronic Effects

- Hyalella azteca: 28-day mortality by EPA Method 100.4;
- Hyalella azteca: 28-day growth by EPA Method 100.4;
- Chironomus dilutus: 20-day mortality by EPA Method 100.5; and
- Chironomus dilutus: 20-day growth by EPA Method 100.5.

Sediment and/or soil samples collected from the base of the stormwater pond on the northwestern portion of the GHSC Property at depths of 18 inches and 2, 3, and 5 feet below the base of the stormwater pond will be handled in accordance with the procedures listed below:

- For safety reasons, the sediment sample will be collected during a dry period in the third quarter of 2018, when the stormwater level in the pond is at its lowest.
- A small boat may be used to facilitate sediment sampling of the stormwater pond if the depth of stormwater is greater than knee-high for the field scientists.
- A 5-foot core of sediment and soil will be collected from the center of the base of the stormwater pond using a sediment hand-corer equipped with a Lexan liner to provide additional media for vertical delineation, if needed. Multiple sediment and soil cores may be collected to provide sufficient sample material at each sample interval.
- Overlying water will be carefully siphoned off the top of the sediment sample immediately after collection, taking care to not lose any overlying fine-grained material.
- Lithological information will be logged during each sampling event, including at a minimum: sample depth or elevation, Unified Soil Classification System description, presence of debris and/or organisms, sediment moisture, and visual and olfactory indications of potential contamination.
- The sample will be collected from the sample liner or using decontaminated stainless steel utensils, placed into a decontaminated stainless steel mixing bowl, and thoroughly homogenized until the matrix is uniform in texture and color prior to being placed in specially cleaned laboratory-provided sample containers. Reusable non-dedicated sampling equipment will be decontaminated between uses, as appropriate.

- Care will be taken not to handle the seal or inside cap of the jar when the sample is placed into the sample containers, and the seals/caps will be secured.
- The sample jar will be labeled with the medium (sediment), date, time sampled, sample identification, project name, project number, and sampler's initials.
- The sample will be logged on a Chain of Custody form and placed into a chilled cooler for transport to the analytical laboratory under standard chain-of-custody protocols.
- Disposable sampling and health and safety supplies and equipment will be discarded in an appropriate waste receptacle.
- The location of each sediment sample will be staked, surveyed using a GPS receiver, and plotted on a scaled drawing. Digital photographs of each location will be taken.

Sediment and/or soil samples collected from the base of the stormwater pond and below will be analyzed for the following parameters used to assess functionality and/or concentrations of COPCs:

- Arsenic, antimony, and lead by EPA 6000 Series Methods;
- PAHs by EPA Method 8270D/SIM;
- Cation exchange capacity by EPA Method 9081;
- Organic content by ASTM Method D2974; and
- Grain-size distribution by ASTM Method D422.

3.5 PORE WATER SAMPLING AND ANALYSIS

If there are data gaps after the surface water and sediment samples have been analyzed and evaluated, pore water samples may be collected from previous surface water and sediment sample locations SD-6 through SD-9; four new surface water and sediment sample locations on the eastern and southeastern portions of the GHSC Property; and two new surface water and sediment sample locations along the North Creek Tributary, proximate to the bridge on 97th Street Northwest that crosses the North Creek Tributary, south of the GHSC property (Figure 3). Pore water samples will be collected during a period of low flow in the North Creek Tributary using methodology similar to that described in *High-Resolution Porewater Sampling Near the Groundwater/Surface Water Interface* dated April 2009, prepared by Ecology. This method uses a stainless steel M.H.E Push Point Sampler coupled with a pump or syringe to extract pore water from the sample locations. Pore water samples will be collected, containerized, and transported to the laboratory as described in Section 3.4.2, Pore Water Sample Collection and Handling Procedures.

3.5.1 Pore Water Sample Identification

The pore water samples will be assigned a unique sample identifier, including the name of the sample location, the medium sampled, and the date the pore water sample was collected (e.g., SD1-

PW-010118). The sample identifier will be placed on the sample label, the Field Report form, Sample Summary forms, and the Chain of Custody form.

3.5.2 Pore Water Sample Collection and Handling Procedures

The sediment samples will be collected and handled in accordance with the procedures listed below:

- Sediment pore water will be collected using a pore water extraction device where the sampling end of the device is inserted into the sediment to the desired depth, a guard rod protecting the screen is removed, and pore water is extracted using a syringe or peristaltic pump;
- Because wading may disrupt bottom sediments and bias results, the field sampler will enter the area downstream of the sampling location and collect the sample while facing upstream;
- Reusable sampling equipment, including the extracting device, will be decontaminated between sample intervals by triple rinsing using a pressure sprayer and laboratory-provided distilled deionized water;
- Samples will be collected after purging and discarding a minimum of 1 to 2 times the interior volume of the sampling system;
- Each sample location will be identified with a pin for surveying the location using GPS;
- The sample container will be labeled with the medium (pore water), date, time sampled, sample identification, project name, project number, and sampler's initials;
- The sample will be logged on a Chain of Custody form and placed into a chilled cooler for transport to the laboratory under chain-of-custody protocols; and
- Disposable sampling and health and safety supplies and equipment will be discarded in an appropriate waste receptacle.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

The QA/QC procedures presented in this section are in accordance with the Quality Assurance Project Plan provided in Appendix C of the RI/FS Work Plan.

4.1 EQUIPMENT DECONTAMINATION PROCEDURES

Reusable non-dedicated equipment used in the collection of and in direct contact with soil, surface water, pore water, and/or sediment samples will be decontaminated prior to arrival at the GHSC Property, between samples collected, upon transition between sample locations, and upon exit from the GHSC Property as described below. The equipment will be:

- Rinsed and pre-cleaned with potable or distilled water;
- Washed in a solution of laboratory-grade non-phosphate–based soap (i.e., Liquinox);
- Rinsed three times with potable or distilled water;
- Rinsed three times with laboratory-grade distilled or deionized water; and
- Air dried.

If decontaminated equipment is not immediately used, it will be wrapped in aluminum foil (dull side facing the equipment) to prevent re-contamination.

Field technicians will wear disposable powder-free nitrile gloves during sample collection and processing. The gloves will be replaced between each sample interval to minimize the potential for cross-contamination of samples.

4.2 FIELD QUALITY CONTROL SAMPLES

Field quality control samples for this investigation will include field split samples, and equipment wipes and wipe blanks for soil and sediment samples.

4.2.1 Field Duplicate Samples

Field duplicate samples will be collected and analyzed to assess the variability associated with sample processing. Blind field duplicate samples will be collected at a minimum frequency of 1 for every 20 field samples processed for each sample medium. One field duplicate sample will be collected from each sample medium with fewer than 20 samples.

4.2.2 Equipment Wipes and Wipe Blanks

Equipment wipe samples will be collected to help identify possible contamination from the sampling environment or from sampling equipment. Equipment wipe samples will consist of clean ashless filter papers provided by the analytical laboratory, and will be collected at a minimum frequency of 1 for every 20 soil or sediment samples processed for each type of reusable non-dedicated equipment in direct contact with the soil and/or sediment being collected. Equipment

wipes will be prepared by wiping down the decontaminated sampling equipment with the filter paper between sampling stations.

One equipment wipe sample will be prepared for each type of analysis conducted, because the equipment can be wiped down only once for each piece of filter paper. This procedure ensures that the filter wipe result represents the most-conservative estimate of cross-contamination for each analysis type. Filter papers will be stored in pre-cleaned glass jars provided by the analytical laboratory. Filter papers will not be stored in plastic bags.

Wipe blanks will be submitted to the analytical laboratory for evaluation of potential background concentrations present in the filter papers used for the equipment wipes. Wipe blanks will be collected at a minimum frequency of one for each lot number of filter papers used for collecting the equipment wipes. Wipe blanks will be archived pending receipt of analytical results for the equipment wipe samples.

4.2.3 Deionized or Distilled Water Blanks

One deionized or distilled water blank will be collected for each container of deionized distilled water to evaluate potential background concentrations present in the laboratory-grade deionized distilled water used to decontaminate the equipment.

5.0 REFERENCES

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6.0 LIMITATIONS

6.1 GENERAL LIMITATIONS

The conclusions contained in this report/assessment are based on professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted hydrogeologic and engineering standards and practices applicable to this location. The conclusions contained herein are subject to the following inherent limitations:

- **Accuracy of Information.** Farallon obtained, reviewed, and evaluated certain information used in this report/assessment from sources that were believed to be reliable. Farallon's conclusions, opinions, and recommendations are based in part on such information. Farallon's services did not include verification of its accuracy or authenticity. Should the information upon which Farallon relied prove to be inaccurate or unreliable, Farallon reserves the right to amend or revise its conclusions, opinions, and/or recommendations.
- **Reconnaissance and/or Characterization.** Farallon performed a reconnaissance and/or characterization of the GHSC Property that is the subject of this report/assessment to document current conditions. Farallon focused on areas deemed more likely to exhibit hazardous materials conditions. Contamination may exist in other areas of the GHSC Property that were not investigated or were inaccessible. Activities at the GHSC Property beyond Farallon's control could change at any time after the completion of this report/assessment.

For the foregoing reasons, Farallon cannot and does not warrant or guarantee that the GHSC Property is free of hazardous or potentially hazardous substances or conditions, or that latent or undiscovered conditions will not become evident in the future. Farallon's observations, findings, and opinions can be considered valid only as of the date of the report hereof.

This report/assessment has been prepared in accordance with the contract for services between Farallon and GHSC, and currently accepted industry standards. No other warranties, representations, or certifications are made.

6.2 LIMITATION ON RELIANCE BY THIRD PARTIES

Reliance by third parties is prohibited. This report/assessment has been prepared for the exclusive use of GHSC to address the unique needs of GHSC at the GHSC Property at a specific point in time. Services have been provided to GHSC in accordance with a contract for services between Farallon and GHSC, and generally accepted environmental practices for the subject matter at the time this report was prepared.

No other party may rely on this report unless Farallon agrees in advance to such reliance in writing. Any use, interpretation, or reliance upon this report/assessment by anyone other than GHSC is at the sole risk of that party, and Farallon will have no liability for such unauthorized use, interpretation, or reliance.

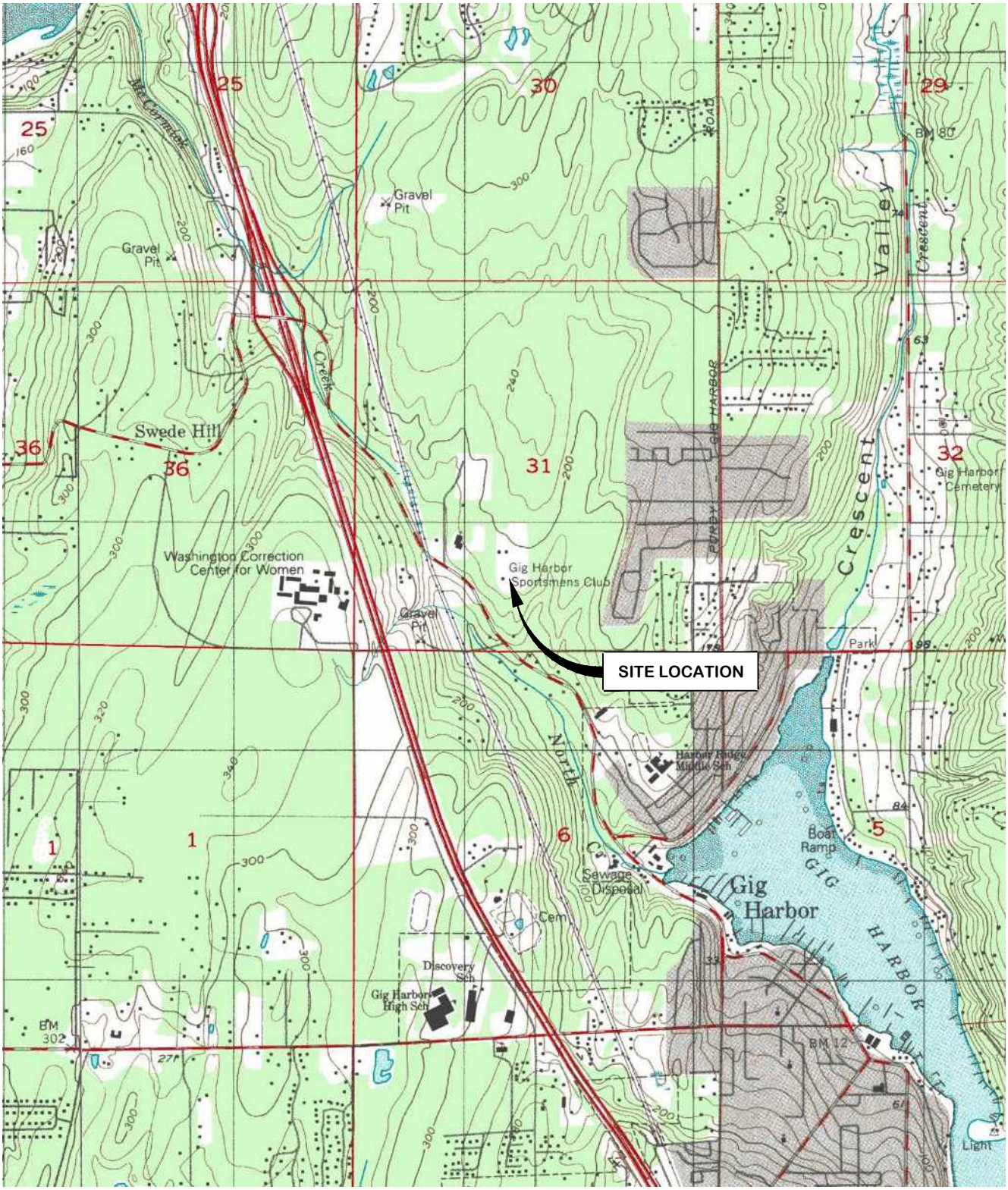
Do not rely on this report/assessment if:

- It was not prepared for you;
- It was not prepared for your project;
- It was not prepared for your specific property; or
- It was not prepared under an approved scope of work for which you are under contract with Farallon.

FIGURES

REVISED SAMPLING AND ANALYSIS PLAN NO. 2
Gig Harbor Sportsman's Club
9721 Burnham Drive Northwest
Gig Harbor, Washington

Farallon PN: 1303-001



REFERENCE: 7.5 MINUTE USGS QUADRANGLE GIG HARBOR, WASHINGTON. DATED 1996

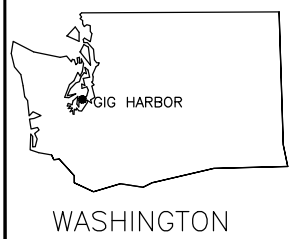


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FIGURE 1

SITE VICINITY MAP
GIG HARBOR SPORTSMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON

FARALLON PN: 1303-001

Drawn By: JJ | Checked By: JM | Date: 06/27/2018 | Disk Reference: 1303-001

HARBOR HILL DRIVE
STORMWATER DETENTION PONDS
FB-01
FB-03
0.0' | 0.011 | 0.024
HB-23
0.0' | <0.0246 | 0.015
HB-21
0.0' | <0.024 | 0.0060
HB-22
0.0' | <0.0252 | 0.055
1.0' | <0.0234 | 0.0059
2.0' | <0.0234 | 0.0059
3.5' | <0.0216 | 0.0054
FB-04
HB-20
0.0' | <0.0252 | 0.013
HB-24
0.0' | <0.0246 | 0.018
FB-02
0.0' | 0.045 | 0.051
4003250960
HB-19
0.0' | <0.0249 | 0.025
HB-25
0.0' | 0.052 | **0.21**
SENTINEL DRIVE
FB-05
FB-09
FB-06
0.0' | 0.103 | **1.15**
0.5' | 0.041 | **0.95**
1.0' | 0.032 | **1.35**
3.6' | 0.0085 | 0.007
FB-07
0.0' | 0.071 | **4.9**
0.5' | <0.0216 | 0.027
1.0' | <0.0216 | 0.0054
FB-08
0.0' | <0.0288 | **0.20**
3.9' | <0.0231 | 0.0058
HB-26
0.0' | <0.0279 | **0.22**
HB-27
0.0' | <0.0267 | 0.040
HB-18
0.0' | 0.039 | 0.037
FB-10
0.5' | 1.1 | **282**
3.3' | <0.0219 | 0.034
FB-11
0.0' | <0.0246 | 0.046
STORMWATER POND
FB-13
0.0' | <0.0252 | 0.062
FB-12
0.5' | <0.45 | **14.7**
3.5' | <0.0216 | 0.0054
FB-15
0.0' | <0.0258 | 0.036
FB-16
0.0' | <0.0246 | 0.0066
FB-14
0.0' | **5.48** | **681**
1.0' | <0.0225 | 0.0057
2.0' | <0.0222 | 0.0056
3.7' | <0.0222 | 0.0056
HB-1
0.2' | <0.0246 | 0.0219
FB-17
0.5' | 0.0419 | **0.113**
3.9' | <0.0225 | 0.0057
FB-18
0.5' | <0.45 | **10.1**
3.8' | <0.0219 | **0.103**
RIFLE AND PISTOL RANGE
HB-2
0.2' | <0.0240 | 0.0255
FB-19
0.5' | <0.45 | **9.2**
2.9' | <0.0219 | 0.0055
FB-20
0.5' | 0.38 | **116**
3.1' | <0.0222 | 0.0060
FB-21
0.5' | 0.58 | **63**
3.8' | <0.0216 | 0.038
HB-3
0.2' | <0.0249 | **0.122**
0.6' | <0.0243 | **0.125**
1.2' | <0.0237 | 0.027
2.1' | <0.0237 | 0.016
FB-22
0.0' | 0.014 | **0.64**
3.0' | <0.0225 | 0.0057
FB-23
0.0' | 0.301 | **21.1**
0.5' | <0.132 | **1.67**
1.0' | <0.255 | **3.0**
2.9' | <0.0252 | 0.0063
FB-24
0.5' | **8.2** | **1203**
1.0' | <0.45 | **10.2**
2.0' | <0.0231 | 0.0058
3.1' | <0.0222 | 0.0061
MW-01
0.0' | <0.0234 | 0.016
0.5' | <0.0222 | 0.0056
FB-25
0.0' | <0.0246 | 0.0070
HB-11
10.5' | <0.0213 | 0.0054
15.0' | <0.0222 | 0.0056
HB-4
0.2' | <0.0243 | 0.03
SHOTGUN RANGE
HB-5
0.2' | <0.0237 | 0.096
HB-6
0.2' | <0.0255 | **0.153**
0.6' | <0.0228 | 0.013
1.3' | <0.0234 | 0.006
2.0' | <0.0231 | 0.0058
SHOT CURTAIN
FB-37
HB-12
10.5' | <0.0213 | 0.0054
15.0' | <0.0222 | 0.0056
FB-26
FB-38
0.0' | <0.42 | **10.2**
2.9' | <0.0234 | 0.0059
HB-7
0.2' | <0.0249 | **0.41**
0.7' | <0.0237 | 0.059
FB-27
0.0' | <0.0240 | **0.164**
3.7' | <0.0213 | 0.0054
FB-28
0.0' | 0.117 | **9.2**
0.5' | <0.0228 | **0.20**
1.0' | <0.0228 | 0.0058
FB-29
0.5' | 1.11 | **99**
1.0' | 0.43 | **37**
2.0' | <0.0243 | **0.41**
3.1' | <0.0249 | 0.036
MW-02
MW-03
HB-13
10.5' | <0.021 | 0.0053
15.5' | <0.0252 | 0.0063
FB-30
HB-8
0.2' | 0.014 | **0.59**
0.7' | <0.0231 | **0.53**
1.1' | <0.0234 | **0.23**
2.0' | <0.0237 | **0.24**
FB-39
1.0' | 4.35 | **387**
5.0' | <0.132 | **2.3**
10.0' | <0.135 | **1.00**
15.0' | <0.0225 | 0.044
20.0' | 0.43 | **42.7**
25.0' | <0.0219 | 0.014
FB-36
HB-15
0.5' | <0.0246 | 0.020
1.5' | <0.0246 | 0.0062
3.5' | <0.0228 | 0.0057
HB-14/14D
0.5' | 0.325 | **22.9**
1.5' | <0.0255 | **0.43**
3.5' | 0.106 | **1.09**
6.0' | <0.0228 | 0.0057
8.0' | <0.0228 | 0.0057
FB-31
0.0' | 0.45 | **37**
1.0' | <0.0225 | 0.065
2.0' | <0.0216 | 0.016
3.5' | <0.0219 | 0.020
HB-16
0.5' | <0.0246 | **0.22**
1.5' | 0.0099 | **0.16**
3.5' | <0.0273 | 0.0069
MW-04
0.5' | 0.11 | **5.0**
1.0' | <0.0237 | **0.122**
2.0' | <0.0222 | **0.50**
5.0' | <0.0234 | **0.115**
10.0' | 0.045 | **0.43**
20.0' | 0.0164 | **1.6**
HB-17
1.5' | <0.0231 | 0.0058
3.0' | <0.0231 | 0.035
10.5' | <0.0246 | 0.0062
15.5' | <0.0222 | 0.0056
FB-32
0.0' | <0.0252 | **0.196**
2.5' | <0.0216 | 0.0054
FB-33
0.0' | <0.0240 | 0.006
FB-40
0.0' | <0.0210 | 0.021
FB-41
0.0' | <0.0219 | 0.012
1.0' | 0.0177 | 0.0053
FB-34
BURNHAM DRIVE NORTHWEST
FB-35
97th STREET NORTHWEST
NORTH CREEK
NORTH CREEK TRIBUTARY

LEGEND

- PROPOSED BORING LOCATION
- BORING
- BACKGROUND BORING
- MONITORING WELL
- HWA SOIL SAMPLE LOCATION
- STREAM
- INTERMITTENT STREAM
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARY
- 4003250960 PIERCE COUNTY PARCEL NUMBER

NOTES:
SOIL SAMPLE ANALYTICAL RESULT =
DEPTH FEET BGS | TOTAL NAPHTHALENES | cPAH TEC
SOIL RESULTS IN MILLIGRAMS PER KILOGRAM

BOLD = CONCENTRATIONS EXCEED MTCA METHOD A CLEANUP LEVEL
< = SOIL SAMPLE CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
BGS = BELOW GROUND SURFACE
cPAH = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBON
TEC = TOXIC EQUIVALENT CONCENTRATION

N

0 90 180
SCALE IN FEET

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE
2. FIGURES WERE PRODUCED IN COLOR.
GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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FIGURE 2

SOIL PAH RESULTS AND
PROPOSED BORING LOCATIONS
GIG HARBOR SPORTMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON

FARALLON PN: 1303-001

Drawn By: tperrin | Checked By: JM | Date: 6/27/2018 | Disc Reference:

Path: Q:\Projects\1303 GigHarbor\Mapfiles\Figures 2_3_Soil_Metals\EcoSubmit2018June_FIG02_SoilPAHS_propborloc.mxd

FB-01
0.0' | — | <14 | — | 17
0.5' | — | <13 | — | 14

FB-02
0.0' | --- | 16 | --- | 130
0.5' | --- | 15 | --- | 230
3.6' | --- | <11 | --- | <5.4

FB-03
0.0' | — | 17 | — | 72
0.5' | — | <13 | — | 25
3.7' | — | <11 | — | <5.7

STORMWATER DETENTION PONDS

FB-04
0.0' | — | <20 | — | 100
0.5' | — | <11 | — | <5.6
3.7' | — | <11 | — | <5.7

FB-05
0.0' | — | <12 | — | 9.3
0.5' | — | <11 | — | 14
2.8' | — | <14 | — | 7.3

FB-06
0.0' | **40** | <16 | 10,000 | **2,400**
0.5' | **2,100** | **22** | 12,000 | **4,000**
3.6' | <6.0 | <12 | 21,000 | 14

FB-07
0.0' | — | <12 | — | 31
0.5' | — | <11 | — | 12

FB-08
0.0' | — | <14 | — | 34
0.5' | — | <14 | — | 37

FB-09
0.0' | — | <13 | — | 11

SD-10
0-0.3' | — | 2.7 | — | 8.5
0.3-0.8' | — | 5.4 | — | 16

FB-10
0.5' | **170** | <11 | 16,000 | **10,000**
3.3' | <5.5 | <11 | 12,000 | <5.5

FB-11
0.0' | — | <12 | — | 83
0.5' | — | <12 | — | 52
3.4' | — | <11 | — | <5.5

FB-12
0.5' | 7.6 | <11 | 12,000 | **680**
3.5' | — | <11 | — | <5.4

FB-13
0.0' | — | <13 | — | 96
0.5' | — | <12 | — | 29

FB-14
0.0' | — | <12 | — | 56
0.5' | — | <11 | — | 27

FB-15
0.0' | 13 | <13 | 22,000 | **1,800**
0.5' | 7.2 | <13 | 23,000 | **620**
3.8' | — | <12 | — | <5.9

FB-16
0.0' | — | <12 | — | <6.2

FB-17
0.5' | 9.9 | <11 | 16,000 | **860**
3.9' | — | <11 | — | <5.6

FB-18
0.5' | 17 | <11 | 19,000 | **530**
3.8' | — | <11 | — | <5.5

FB-19
0.5' | **49** | <11 | 17,000 | **1,500**
2.9' | <5.5 | <11 | 9,500 | <5.5

FB-20
0.5' | — | <11 | — | 89

FB-21
0.5' | 5.7 | <11 | 15,000 | **14,000**
3.8' | — | <11 | — | <5.4

FB-22
0.0' | — | <12 | — | 47
0.5' | — | <13 | — | 43
3.0' | — | <11 | — | <5.7

FB-23
0.0' | — | <14 | — | 79
0.5' | — | <13 | — | 94

FB-24
0.5' | — | <12 | — | 55
1.0' | — | <11 | — | 90

FB-25
0.0' | — | <12 | — | 65

FB-26

FB-27
0.0' | — | <12 | — | 9.7
0.5' | — | <12 | — | <5.8
3.7' | — | <11 | — | <5.3

FB-28
0.0' | 17 | <15 | 16,000 | **370**
0.5' | — | <11 | — | 12

FB-29
0.5' | — | <11 | — | 13
1.0' | — | <11 | — | 11

FB-30
0.0' | — | <11 | — | 16
0.5' | — | <12 | — | 62
3.7' | — | <11 | — | <5.5

FB-31
0.0' | — | <13 | — | 58
0.5' | — | <11 | — | <5.6

FB-32
0.0' | — | <13 | — | 29
0.5' | — | <11 | — | 6.6

FB-33
0.0' | — | <12 | — | 8.5

FB-34
0.5' | — | <12 | — | <6.0

FB-35
0.0' | — | <13 | — | 15
0.5' | — | <12 | — | 10

FB-36
0.0' | — | <11 | — | <5.4
0.5' | — | <11 | — | <5.4

FB-37
0.0' | — | <11 | — | 6.1
0.5' | — | <11 | — | <5.4

FB-38
0.0' | — | <11 | — | 74

FB-39

FB-40

FB-41

FS-NCS-1
NA | — | 4.2 | — | **300**

FS-NCS-2
NA | — | 8.3 | — | 240

FS-NCS-3
NA | — | 8.1 | — | 240

FS-NCS-4
NA | — | 6.1 | — | 220

FS-NCS-5
NA | — | **17** | — | **500**

MW-01
0.0' | 13 | <12 | 5,700 | **800**
0.5' | — | <11 | — | 73
50.0' | — | <11 | — | <5.5

MW-02
0.0' | 870 | 71 | 16,000 | 10,000
0.5' | 64 | <12 | 19,000 | 870
1.0' | 320 | 270 | 16,000 | 49,000
4.6' | <5.4 | <11 | 12,000 | <5.4
10.0' | <5.4 | <11| 13,000 | <5.4
30.0' | | <11 | | <5.6

MW-03
0.0' | — | <11 | — | 13
0.5' | — | <12 | — | 13
45.0' | — | <12 | — | <5.9

MW-04
0.5' | — | <12 | — | 30
1.0' | — | <12 | — | <5.9
2.0' | — | <11 | — | <5.6
50.0' | — | <11 | — | <5.7

SD-1
NA | — | — | — | 73

SD-2
NA | — | — | — | **420**

SD-6
0-0.3' | 3.8 | 10 | 11,000 | **380**
0.3-0.7' | — | 4.9 | — | 120

SD-7
0-0.3' | 13 | 9.9 | 13,000 | **590**
0.3-1.0' | 4.8 | 14 | 10,000 | **810**
1.0-1.5' | 2.9 | 2.9 | 7,100 | **380**

SD-8
0-0.3' |**1,100** | **270** | 15,000 | **44,000**
0.3-0.7' | **3,200** | **340** | 17,000 | **20,000**
0.7-1.0' | **4,800** | **510** | 15,000 | **28,000**

SD-9
0-0.3' | — | 5.3 | — | 18
0.75-0.9' | — | 2.9 | — | <6.1

HB-1, HB-2, HB-3, HB-4, HB-5, HB-6, HB-7, HB-8, HB-11, HB-12, HB-13, HB-14/14D, HB-15, HB-16, HB-17, HB-18, HB-19, HB-20, HB-21, HB-22, HB-23, HB-24, HB-25, HB-26, HB-27

STORMWATER POND

RIFLE AND PISTOL RANGE

SHOTGUN RANGE

SHOT CURTAIN

HARBOR HILL DRIVE

SENTINEL DRIVE

BURNHAM DRIVE NORTHWEST

97th STREET NORTHWEST

NORTH CREEK TRIBUTARY

NORTH CREEK

1 2 3 4 5 6 7 8 9 10 11 12 13

A B C

LEGEND

- PROPOSED SURFACE WATER AND/OR SEDIMENT SAMPLE LOCATION
- BORING
- BACKGROUND BORING
- MONITORING WELL
- SEDIMENT SAMPLE (FARALLON 2017)
- SEDIMENT SAMPLE (FARALLON 2014)
- SEDIMENT SAMPLE (FLOYD|SNIDER 2014)
- HWA SOIL SAMPLE LOCATION
- SEDIMENT SAMPLE LOCATION TO BE ANALYZED FOR ACUTE AND CHRONIC TOXIC EFFECTS
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARY.
- A / 1 FIELD SCREENING GRID (100' x 100') AND GRID IDENTIFIER
- PROPOSED BORING LOCATION
- SURFACE WATER SAMPLE LOCATIONS
- OUTFALL
- STORM DITCH
- CONVEYANCE PIPING
- CULVERT
- STREAM
- INTERMITTENT STREAM

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

NOTES:
SOIL SAMPLE ANALYTICAL RESULT =
DEPTH FEET BGS | ANTIMONY | ARSENIC | IRON | LEAD
SOIL AND SEDIMENT RESULTS IN MILLIGRAMS PER KILOGRAM

BOLD = CONCENTRATIONS EXCEED APPLICABLE SOIL OR SEDIMENT SCREENING LEVELS
< = SAMPLE CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
--- = SAMPLE NOT ANALYZED
BGS = BELOW GROUND SURFACE

N

0 80 160
SCALE IN FEET

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FIGURE 3

SOIL AND SEDIMENT METALS RESULTS AND PROPOSED SAMPLING/FIELD SCREENING LOCATIONS
GIG HARBOR SPORTMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON

FARALLON PN: 1303-001

Drawn By: tperrin | Checked By: JM | Date: 6/29/2018 | Disc Reference:

Path: Q:\Projects\1303 GigHarbor\Mapfiles\Figures 2_3_Soil_Metals\EcoSubmit_2018June\FIGURE 03_Metals_PropBorLoc_SedStormwater.mxd

STORMWATER DETENTION PONDS

HARBOR HILL DRIVE

SENTINEL DRIVE

SD-10
10/25/2017 | **0.854** | **2.40**

STORMWATER POND

RIFLE AND PISTOL RANGE

SD-9
10/25/2017 | **0.898** | **2.97**

SHOTGUN RANGE

SHOT CURTAIN

SD-8
10/25/2017 | **32.5** | **2.70**

SD-7
10/25/2017 | **83.3** | **2.73**

97th STREET NORTHWEST

SD-6
10/25/2017 | **80.5** | **2.47**

BURNHAM DRIVE NORTHWEST

NORTH CREEK

NORTH CREEK TRIBUTARY

SD-3
10/25/2017 | **10.4** | 1.31

SD-5
10/25/2017 | **29.9** | **2.42**

SD-4
10/25/2017 | 0.140 | 0.93

LEGEND

- PROPOSED SURFACE WATER AND/OR SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATIONS
- OUTFALL
- STORM DITCH
- CONVEYANCE PIPING
- CULVERT
- STREAM
- INTERMITTENT STREAM
- APPROXIMATE PROPERTY BOUNDARY
- PIERCE COUNTY PARCEL BOUNDARY.

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

NOTES:
SURFACE WATER RESULTS DEPICTED AS:
DATE SAMPLED | DISSOLVED LEAD | DISSOLVED COPPER
ANALYTICAL RESULTS IN MICROGRAMS PER LITER.

BOLD = CONCENTRATIONS EXCEED APPLICABLE SOIL OR SEDIMENT SCREENING LEVELS
< = SAMPLE CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
--- = SAMPLE NOT ANALYZED

N

0 120 240
SCALE IN FEET

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FIGURE 4

SURFACE WATER METALS RESULTS
AND PROPOSED SAMPLE LOCATIONS
GIG HARBOR SPORTMAN'S CLUB
9721 BURNHAM DRIVE NORTHWEST
GIG HARBOR, WASHINGTON

FARALLON PN: 1303-001

Drawn By: tperrin | Checked By: JM | Date: 6/28/2018 | Disc Reference:

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