



DEPARTMENT OF
ECOLOGY
State of Washington

**Addendum 1 to
Quality Assurance Project Plan**

**Columbia River Basin (Clark County WA)
Local Source Control Monitoring for
Toxics: Phase I Screening Study**

August 2018

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Publication Information

Addendum

This addendum is on the Department of Ecology's website at <https://fortress.wa.gov/ecy/publications/SummaryPages/1803116.html>

This addendum is an addition to an original Quality Assurance Project Plan. It is not a correction (errata) to the original plan.

Data for this project will be available on Ecology's Environmental Information Management (EIM) website at [EIM Database](#). Search Study ID JMED0001.

Activity Tracker code

Ecology's Activity Tracker code for this addendum is 17-002

Original Publication

Quality Assurance Project Plan: **Columbia River Basin (Clark County WA) Local Source Control Monitoring for Toxics: Phase I - Screening Study**. Ecology Publication No. 17-03-102
<https://fortress.wa.gov/ecy/publications/SummaryPages/1703102.html>

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Addendum 1 to Quality Assurance Project Plan

Columbia River Basin (Clark County, WA) Toxics Local Source Control Monitoring, Toxics: Phase I Screening Study

August 2018

Approved by:

Signature: Elaine Snouwaert, Client, HWTR LSC Program	Date:
Signature: Ken Zarker, Client's Section Manager, HWTR Program	Date:
Signature: James Medlen, Author / Project Manager, EAP	Date:
Signature: Debby Sargeant, Toxic Studies Unit Supervisor, EAP	Date:
Signature: Jessica Archer, Author's Section Manager, EAP	Date:
Signature: Alan Rue, Director, Manchester Environmental Laboratory	Date:
Signature: Tom Gries, Ecology Acting Quality Assurance Officer	Date:

EAP: Environmental Assessment Program
HWTR: Hazardous Waste and Toxics Reduction

3.0 Background

This first addendum details the second phase of the project's Local Source Control monitoring in Clark County. The original approved QAPP (Medlen, 2017) can be found at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1703102.html> .

This addendum proposes modifications of the original QAPP to meet the needs of prioritized hot spot monitoring.

The first phase of the project monitored seven core sites for sediments and stormwater as well as additional upstream and downstream sites for sediment only. Samples collected were analyzed by Ecology's Manchester Environmental Laboratory (MEL). High resolution analytical work was performed under subcontract by SGS AXYS Analytical Services Laboratory.

The goal of Phase I was to conduct water quality screening and sediment screening to characterize and prioritize parameters and locations for future phases of the study. The objectives were as follows:

- Screen stormwater pollutant concentrations in priority Municipal Separate Storm Sewer System (MS4) drainage area outfalls and vaults from January through June 2017.
- Screen sediment pollutant concentrations in selected MS4 drainage area outfalls and vaults from January through June 2017 during antecedent dry periods.
- Analyze results to reduce and prioritize the number of study parameters for focus in future phases of the study.

The goals and objectives of the first phase of the study were met; stormwater and sediment sample events were completed, toxic concentrations in the MS4 system were characterized to the extent possible given the sample size, and locations and study parameters were prioritized for follow-up monitoring in the second phase of the study.

Findings and recommendations for the first phase of the study are detailed in the study report *Clark County Local Source Control Partnership Monitoring, Findings and Recommendations, 2017* (Medlen, 2018) found at the following link: <https://fortress.wa.gov/ecy/publications/SummaryPages/1803018.html>.

Report recommendations ranked seven sites in order of priority (hot spots) for follow-up monitoring and source tracing. Report recommendations also included the elimination of stormwater monitoring in order to focus on sediments. Laboratory analysis during Phase II of the study will be similar to Phase I with the exception of gasoline and nutrients being removed from the analyte list as they were largely undetected.

5.0 Organization and schedule

5.1 Key individuals and their responsibilities

Several changes in personnel have occurred since the original QAPP. In 2017, Elaine Snouwaert replaced Peggy Morgan as the Local Source Control Lead in HWTR Program (Table 1). Alan Rue became the new laboratory director at MEL, and Tom Gries became the acting QA officer for EAP.

Table 1. Organization of project staff and responsibilities

Staff	Title	Responsibilities
Ken Zarker/Elaine Snouwaert HWTR, Local Source Control Phone: 360-407-6724	EAP Client	Clarifies scope of the project. Provides internal review of the QAPP and approves the final QAPP.
Jim Medlen Toxic Studies Unit, EAP Phone: 360-707-6194	Project Manager and Principal Investigator	Writes the QAPP. Oversees field crew sampling and transportation of samples to the laboratory. Conducts QA review of data, analyzes and interprets data, and enters data into EIM. Writes the draft report and final report.
Bob Patterson Clark County, Clean Water Phone: 360-397-6118 ext. 4493	Operations Specialist	Coordinates LSC activities at Clark County Public Works.
Rod Swanson Clark County, Clean Water Phone: 360-397-6118 ext. 4581	NPDES Manager	As Clark County monitoring supervisor, reviews QAPP and advises on program approach.
Debby Sargeant Toxic Studies Unit, EAP Phone: 360-407-6775	Unit Supervisor for the Project Manager	Provides internal review of the QAPP, approves the budget, and approves the final QAPP.
Jessica Archer SCS, EAP Phone: 360-407-6698	Section Manager for the Project Manager	Reviews the project scope and budget, tracks progress, reviews the draft QAPP, and approves the final QAPP.
Alan Rue Manchester Environmental Laboratory, EAP Phone: 360-871-8801	Laboratory Director	Reviews and approves the final QAPP.
Ginna Grepo-Grove Manchester Environmental Laboratory, EAP Phone: 360-871-8829	QA Coordinator	Reviews QAPP, coordinates and obtains analytical services with contract laboratories. Validates the contract lab analytical data
Tom Gries Phone: 360-407-6964	Ecology Acting Quality Assurance Officer	Reviews the draft QAPP and approves the final QAPP.

HWTR: Hazardous Waste Toxics Reduction Program.

EAP: Environmental Assessment Program.

EIM: Environmental Information Management database.

QAPP: Quality Assurance Project Plan.

SCS: Statewide Coordination Section.

5.4 Project schedule

Table 2 displays the Phase II project schedule.

Table 2. Phase II Project Schedule.

Product	Due date	Lead staff
Sediment Screening		
Sediment Samples	August–September 30, 2018	Jim Medlen
QA review and analytical data validation	Each sample batch analysis	Alan Rue
Laboratory Analysis Completed	June 1, 2019	Jim Medlen
Environmental Information System (EIM) database		
EIM data loaded ¹	September 15, 2019	Jim Medlen
EIM data entry review ²	September 30, 2019	TBD
EIM complete ³	October 15, 2019	Jim Medlen
Reports		
Draft Report to Supervisor	November 1, 2019	Jim Medlen
Draft Report to Client and County/Peer Review	February 1, 2020	Jim Medlen
Publications Coordinator Edit/Review	March 1, 2020	Ruth Froese
2018 Findings and Recommendations Report Phase II Published	May 1, 2020	Jim Medlen

¹ All data entered into EIM by the lead person for this task.

² Data verified to be entered correctly by a different person; any data entry issues identified.

³ All data entry issues identified in the previous step are fixed (usually by the original entry person)

5.6 Budget and funding

Table 3 describes the study's budget during year one of Phase II. The study is funded on a biennial basis.

Table 3. Phase II budget for sediment screening.

Parameter	Number of Samples/year	Number of	Total Number of Samples ²	Cost Per Sample	MEL Subtotal ³	Contract Fee	
Total organic carbon	20	0	20	\$50	\$1,000	\$0	
Grain size ¹	15	0	15	\$100	\$1,500	\$450	
Total volatile solids	20	0	20	\$25	\$500	\$0	
Metals (As, Ag, Sb, Be, Cd, Cr, Cu, Hg, Pb, Ni, Ti, Tl, Se, Co, Zn) ICPMS, Mercury Hg 245.1 w 7471 s; Sb s requires 2nd digestion	15	2	17	\$244	\$4,148	\$0	
PAHs	30	4	34	\$340	\$11,560	\$0	
Phthalates							
PCB Congeners NOAA	30	4	34	\$190	\$6,460	\$0	
Petroleum Hydrocarbons (NWTPH-DX)	15	2	17	\$180	\$3,060	\$0	
Organophosphorous Flame Retardants (OPFRs)	30	4	34	\$400	\$13,600	\$0	
PESTMSQ3 - (includes Npest, OPpest, Clpest lists) GCMSMS	30	4	34	\$580	\$19,720	\$0	
PFAS	15	2	17	\$800	\$13,600	\$0	
¹ Additional sediment and stormwater samples have been added to screening as a backup, or to sample receiving water if high levels are detected or suspected. ² Sediment screening and source tracing QA includes 1 field duplicate and 1 matrix spike/matrix spike duplicate charged by MEL laboratory for metals, organics, and hydrocarbons. ³ Includes 25% fee for contract parameters.				Sediment Screening Subtotal		\$75,148	\$450
				Lab Grand Total		\$75,598	

7.0 Sampling process design (experimental design)

7.1 Study design

Phase I of the study was designed to characterize sediment and stormwater quality in Clark County's MS4 system through screening to support future phases of the project. Screening is a necessary step in confirming the presence or absence of contaminants at priority sites and ensures that more extensive and costly investigation/analysis is warranted.

Sediment from MS4 system drainage area outfalls and vaults was collected from January 2017 through June 2017 during antecedent dry periods. An antecedent dry period is defined as less than 0.02" precipitation in the preceding 48 hours.

The study report *Partnership Monitoring, Findings and Recommendations, 2017* (Medlen, 2018) was published in May 2018 and can be found here: <https://fortress.wa.gov/ecy/publications/SummaryPages/1803018.html>. The report establishes a list of priority sites for further monitoring upstream within site drainages.

Phase II of the project will focus on monitoring sediment at selected sites upstream of Phase I identified priority outfalls and catch basins to trace potential sources of toxics. A site reconnaissance was conducted on July 12, 2018 to determine feasibility and accessibility of selected sites. Sites will be monitored from August through September of 2018.

Coordination with the County's LSC specialist and the Clean Water Division will ensure that site access during screening and sediment collection activities is feasible and permitted.

Sites with elevated toxic concentrations or those that exceed the Washington Sediment Management Standards (Chapter 173-204 WAC) (Ecology, 2013) will be earmarked for County small business outreach and further monitoring if warranted.

Similar to Phase I of the project, parameters detected at levels in exceedance to existing regulatory criteria, or at elevated levels if no criteria exists (75th percentile of existing MS4 data), will be prioritized for outreach.

7.1.2 Sampling location and frequency

A site reconnaissance photo log documenting the July 12, 2018 monitoring site reconnaissance can be found in Appendix A of this addendum.

Table 4 lists and updates the study's original Phase I core sites and includes Phase II monitoring sites.

Table 4. Phase I and Phase II Monitoring Sites.

Site ID	Receiving Water	Latitude	Longitude	Phase
LS_NE102	Lower Salmon	45.695832	-122.656969	1
LS_NE102_BASIN	Lower Salmon	45.695505	-122.656825	2
LS_NE102_A	Lower Salmon	45.694499	-122.656605	2
LS_NE102_B	Lower Salmon	45.693528	-122.655393	2
LS_NE102_RESREF	Lower Salmon	45.689408	-122.653248	2
LR_NW3RDCT	Lake River	45.724906	-122.674478	1
CC_NE85	Cougar Canyon	45.684165	-122.669689	1
CC_NE85US	CC_NE85US	45.681059	-122.665061	2
CC_CCAPT	Cold Creek	45.669422	-122.644967	1
NE68_FA2482	NE68_FA2482	45.669965	-122.627599	2
NE68BASIN2US	NE68BASIN2US	45.669965	-122.627599	2
NE47thAVE	NE47thAVE	45.670539	-122.622489	2
BB_STJOHNSMINNEHAHA	Cold Creek	45.668908	-122.643628	1
LR_HWY99	Lake River	45.706647	-122.657889	1
SCTRIB	Salmon Creek	45.706814	-122.650331	1
WC_NE10NE149	Whipple Creek	45.724306	-122.674389	1
WC_NW149_RESREF	Whipple Creek	45.726726	-122.674404	2
WC_NW3RDCT_US	Whipple Creek	45.724735	-122.668293	2
WC_NE136_NE16	Whipple Creek	N/A	N/A	2
CC_FIRE	Cougar Canyon	45.686080	-122.671610	2

During Phase I, the study screened selected outfall locations, conducted three sediment sampling events for core sites as well as two additional screenings of upstream and downstream sites during dry weather conditions in spring of 2017. Dry weather conditions are defined as an antecedent dry period, which has had less than or equal to 0.02 inches of rain in the previous 48 hours. Phase II will sample sites at a minimum of one time at core sites and two times for Phase II sites during dry weather conditions.

7.1.3 Parameters to be determined

All proposed parameters during Phase I of the project were screened to determine their concentrations. In Phase II, parameters that were detected at low levels or not at all will be eliminated from monitoring. These parameters include gasoline and nutrients.

7.2 Maps or diagram

Phase II monitoring site maps have been added to the QAPP to show the locations of the proposed upstream and downstream sites as seen in Figures 1 through 5 following. Included in the maps are the Phase I core sites, monitoring drainage land use, and County MS4 stormwater line work.

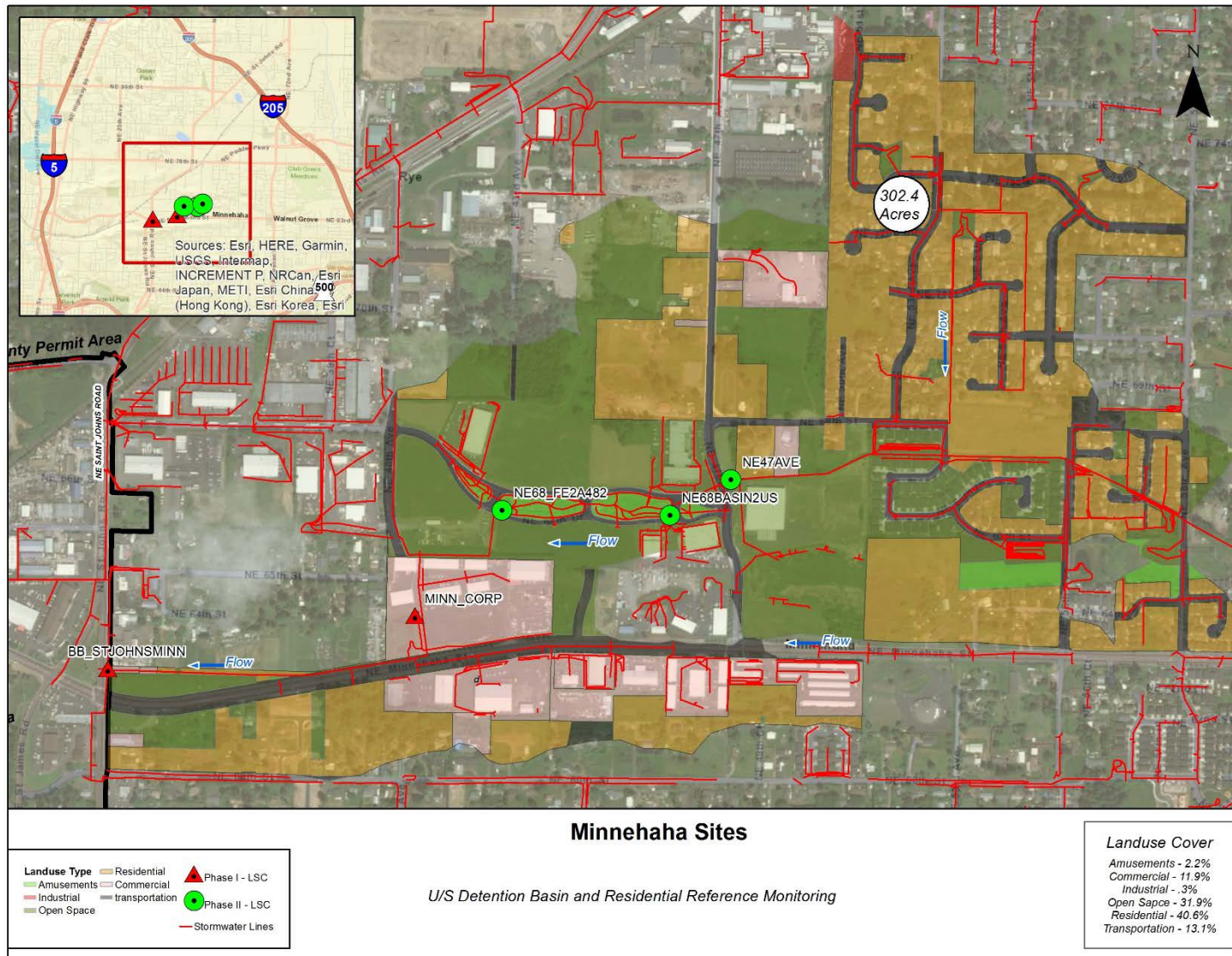


Figure 1 Minnehaha Phase I and II Sites

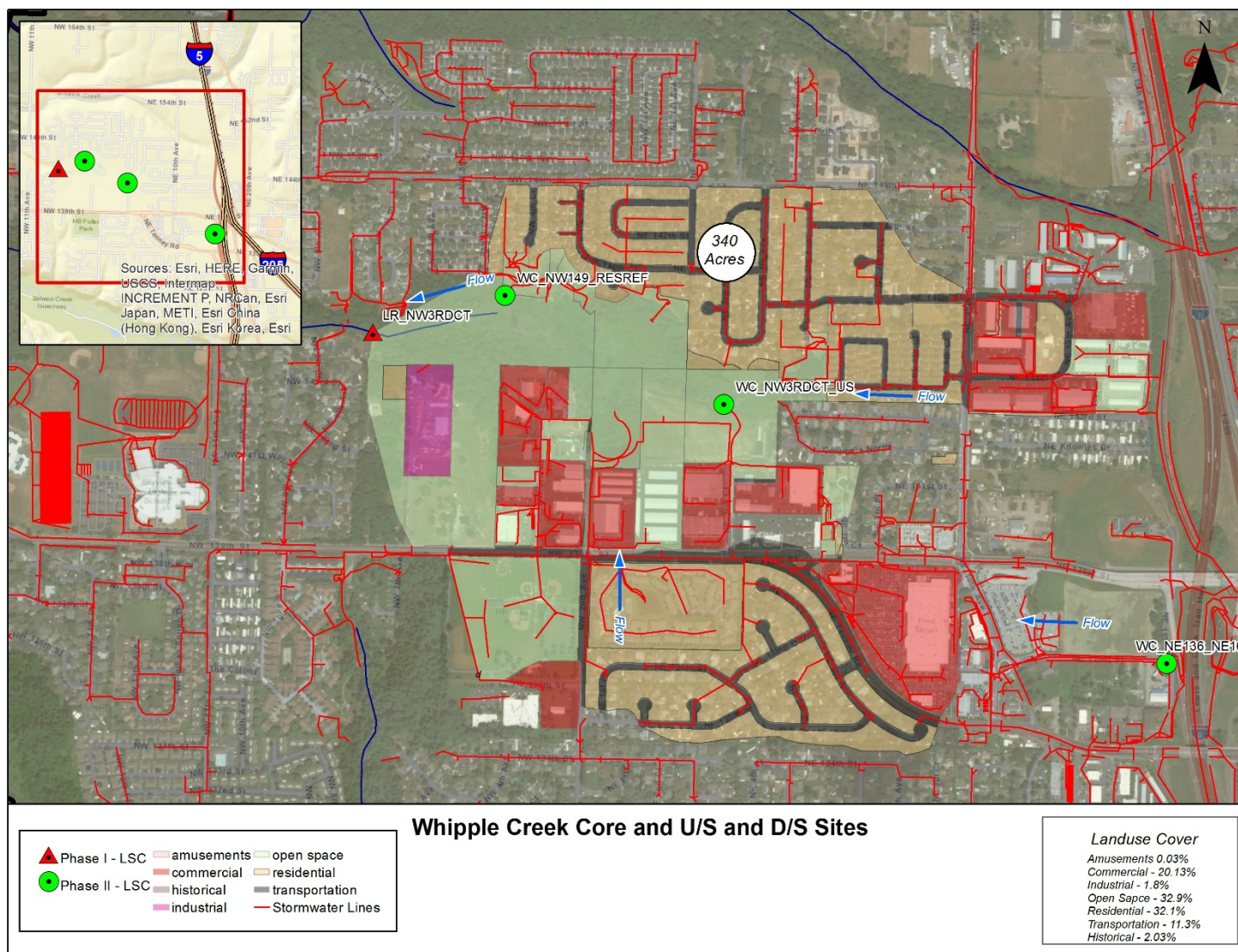


Figure 2 Whipple Creek Phase I and II Sites

Addendum to QAPP: Columbia River Basin Toxics Local Source Control Monitoring, Phase 2

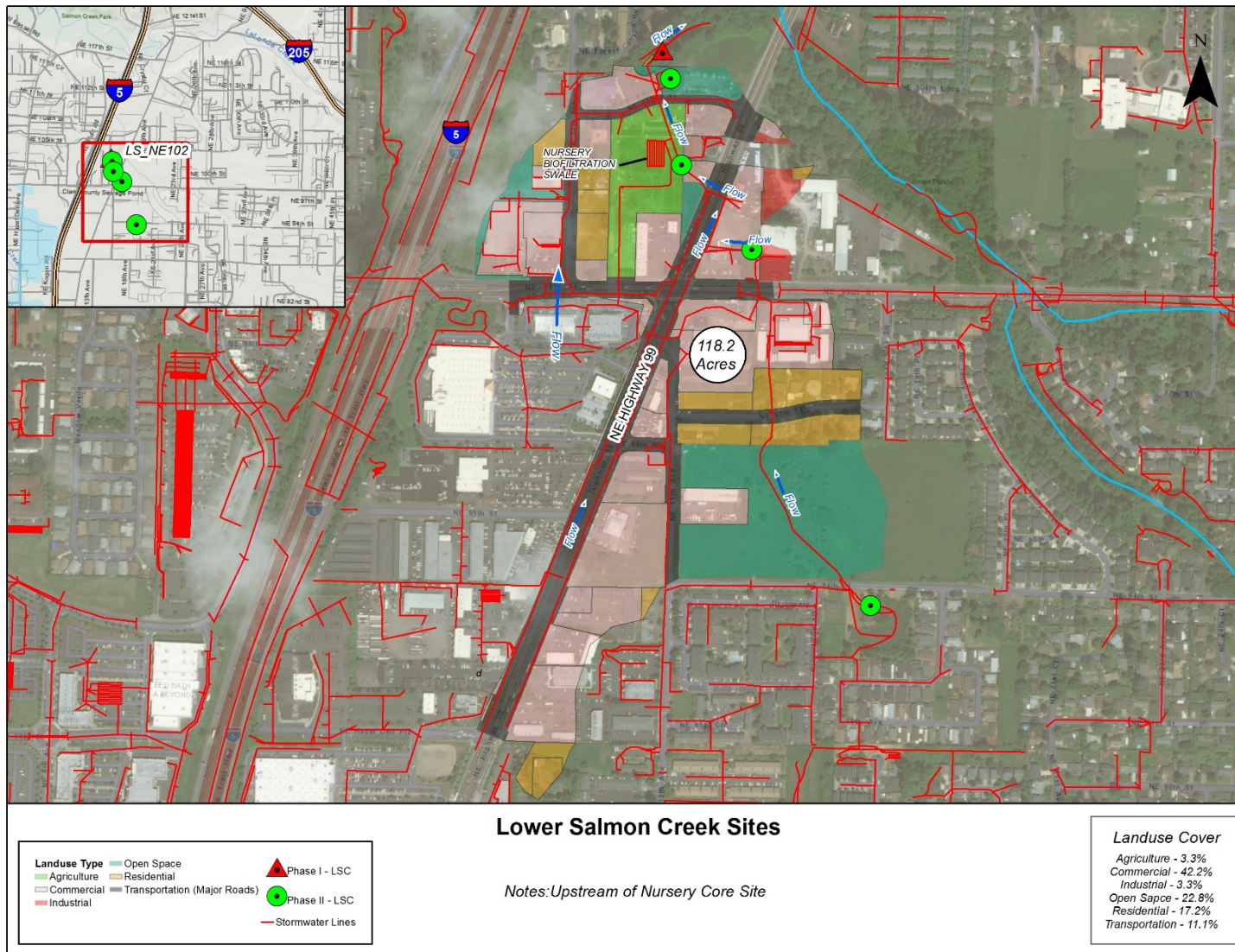


Figure 3 Lower Salmon Creek Phase I and II Sites

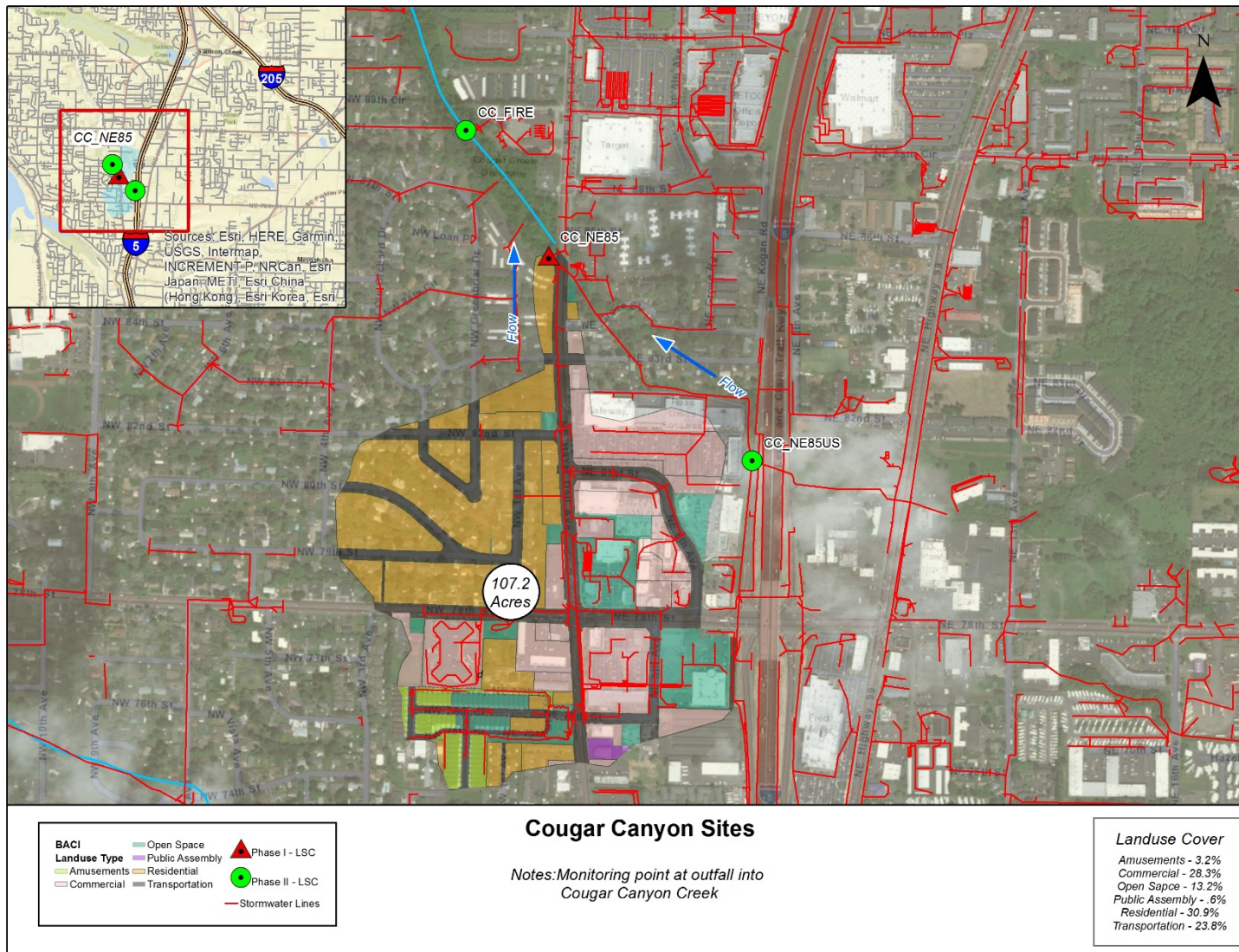


Figure 4 Cougar Canyon Creek Phase I and II Sites

9.0 Measurement methods

Measurement methods in this addendum are a subset of the suites listed in the original QAPP.

Table 5. Sediment Measurement Methods

Analyte Group	Analyte	Sample Matrix	Expected Concentrations	Reporting Limit	Extraction Method	Cleanup Method	Analytical (Instrument Method)
Conventional Parameters	Percent solids	Sediment	N/A	N/A	N/A	N/A	SM 2540G (PCT)
	Total Organic Carbon (TOC)	Sediment	N/A	0.1%	N/A	N/A	PSEP (1986) ¹
	Grain size	Sediment	<20%–>80% silt and sand	N/A	N/A	N/A	PSEP (1986)
	pH	Sediment	NA	NA	NA	NA	EPA 9045
	Total Volatile Solids (TVS)	Sediment	NA	NA	NA	NA	SM 2540G
	Zinc (Zn)	Sediment	< 5.0–541 mg/kg	5.0 mg/kg	EPA 3050B	N/A	SW6020B
	Lead (Pb)	Sediment	< 0.1–74.0 mg/kg	0.1 mg/kg	EPA 3050B	N/A	
	Copper (Cu)	Sediment	< 0.1–90.0 mg/kg	0.1 mg/kg	EPA 3050B	N/A	
	Cadmium (Cd)	Sediment	< 0.1–1.20 mg/kg	0.1 mg/kg	EPA 3050B	N/A	
	Silver (Ag)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Titanium (Ti)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Antimony (Sb)	Sediment	N/A	0.2 mg/kg	EPA 3050B	N/A	
	Arsenic (As)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Cobalt (Co)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Selenium (Se)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Thallium (Tl)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Beryllium (Be)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	

¹ Measured by elemental analyzer.

Analyte Group	Analyte	Sample Matrix	Expected Concentrations	Reporting Limit	Extraction Method	Cleanup Method	Analytical (Instrument Method)
	Nickle (Ni)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Chromium (Cr)	Sediment	N/A	0.1 mg/kg	EPA 3050B	N/A	
	Mercury (Hg)	Sediment	< 0.005–.05 mg/kg	0.005 mg/kg	EPA Method 7471B	N/A	EPA Method 7471B
Persistent Organic Compounds	PCB Congeners	Sediment	N/A	0.25ug/kg	EPA 3541	EPA 3620, 3665	EPA Method 8082B
	OPFRs	Sediment	N/A	0.80 ug/kg	AOAC 2007.01	AOAC 2007.01	EPA Method 8321B LCMSMS
	PFAS ¹	Sediment	<.5–1,000 ng/g	0.5–1.0 ng/g ²	AOAC 2007.01 ³	AOAC 2007.01 ³	EPA 8321B Mod. LC-MS/MS; isotopic dilution
Petroleum Hydrocarbons	NWTPH-Dx	Sediment	N/A	25.0–100.0 mg/kg	EPA 3541	NA	NWTPH-Dx GCFID
Semivolatile Organic Compounds	Phthalates	Sediment	<12–1600 ug/kg	12.5–125 ug/kg	EPA 3541	EPA 3630C	EPA Method 8270 D
	PAHs	Sediment	>300 ug/kg	12.5–50 ug/kg	N/A	EPA 3630C	EPA Method 8270 D
Pesticides	Pesticides	Sediment	N/A	5–100 ug/kg	AOAC 2007.01	AOAC 2007.01	EPA Method 8270D GCMSMS

² The stated reporting limits for PFAS compounds may change based on data generated during the PFAS method development.

³ MEL will use QuEChERS buffered methods to control pH; SGS AXYS used methanol extraction and solid phase cleanup method.

9.4 Special method requirements

During Phase II, MEL will conduct the Perfluoroalkyl Acids analysis. For Phase I SGS AXYS Analytical Services (AXYS) laboratory conducted this analysis. MEL requires a longer period of time to analyze the pesticide and Perfluoroalkyl Acid samples because they are currently developing these analytical methods. Holding times for these parameters can be up to a year. It is anticipated that sample analysis will be complete by late spring of 2019. For Phase I, SGS AXYS used methanol extraction and solid phase cleanup methods; for Phase II, MEL will use extraction and cleanup method AOAC 2007.1 (QuEChERS method).

9.5 Lab(s) accredited for method(s)

All analyses will be carried out at Manchester Environmental Laboratory (MEL) with the exception of grain size, which will be subcontracted out.

MEL is not accredited to measure pesticides in SOIL by GCMS or to analyze PFAS. As such, MEL will request to waive the requirement of using an accredited lab. The waiver will be based on an agreement to use a suite of QC samples and other means to demonstrate analytical capabilities and performance. After completion of the project, MEL will submit an application for accreditation. If MEL cannot demonstrate adequate capabilities and performance prior to analyzing samples for PFAS, the analyses will be performed by an accredited contract lab or by a lab that has already obtained a waiver from the accreditation requirement.

12.0 Audits and reports

12.3 Frequency and distribution of report

A Phase II screening report summary will be drafted at the end of year one. The report will provide the following details:

- Status of the project and any potential problems in need of resolution
- Data results summary
- Accomplishments
- Monitoring and laboratory QA/QC information for the affected period
- Recommendations and prioritization for outreach activities

The report will be distributed to Ecology HWTR program management, the Toxic Studies Unit Manager, and Clark County Clean Water Division for review and comment. The study reports will be completed by March 2020.

References

Ecology, 2013. Sediment Management Standards, WAC 173-204-563 Sediment cleanup levels based on protection of the benthic community in freshwater sediment. Washington State Department of Ecology, Lacey, WA. Found online at:

<http://app.leg.wa.gov/WAC/default.aspx?cite=173-204>.

Medlen, J., 2017. Quality Assurance Project Plan, Columbia River Basin (Clark County, WA) Local Source Control Monitoring for Toxics: Phase I—Screening Study. Environmental Assessment Program, Toxics Studies Unit, Washington State Department of Ecology. Publication No. 17-03-102.

<https://fortress.wa.gov/ecy/publications/SummaryPages/1703102.html>.

Medlen, J., 2018. Clark County Local Source Control Partnership Monitoring, Findings and Recommendations, 2017. Environmental Assessment Program, Toxics Studies Unit, Washington State Department of Ecology. Publication No. 18-03-018.

<https://fortress.wa.gov/ecy/publications/SummaryPages/1803018.html>.

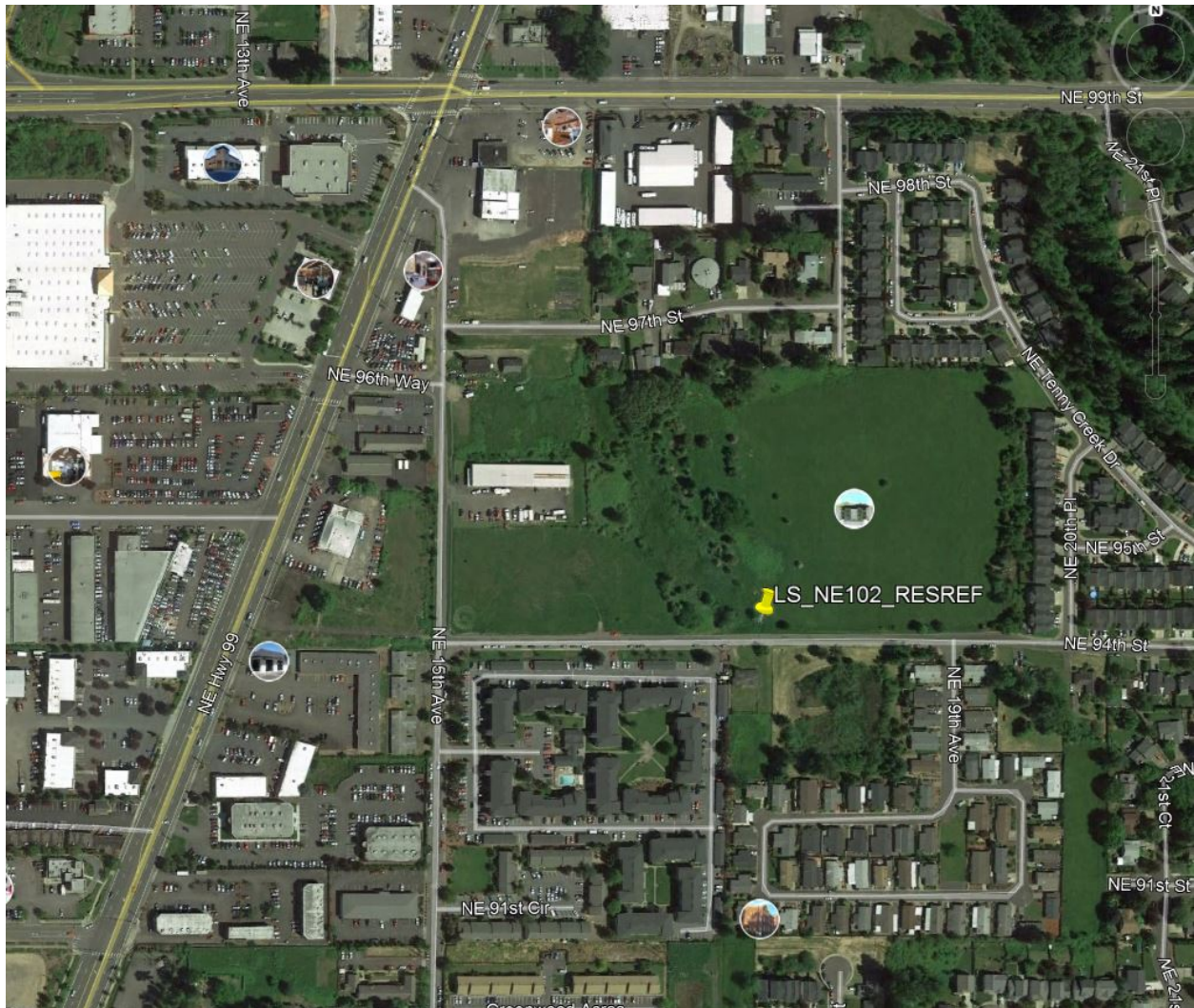
APPENDIX A

Site Locations and Photos

Lower Salmon Creek Sites (Upstream to Downstream)



1. LS_NE102_RESREF





Site ID: LS_NE102_RESREF
Date: July 12, 2018

Location: Lower Salmon
Creek

Comments: New housing
development being built
northeast of the drain.
Original channel has been
modified and armored.
Looking upstream (south)
toward culvert road crossing
under NE 94th Street.

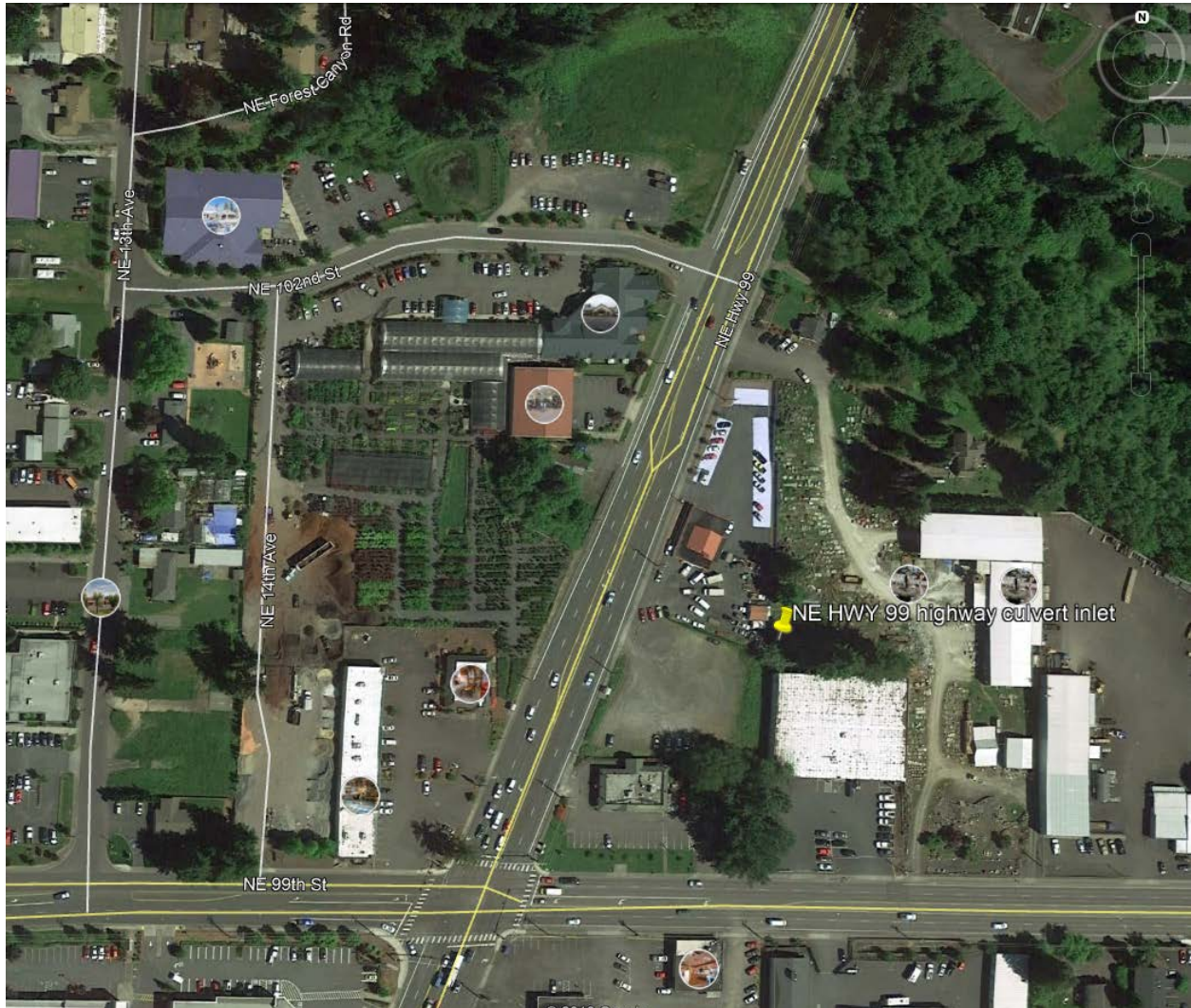




Site ID: LS_NE102_RESREF
Date: July 12, 2018

Location: Lower Salmon
Creek

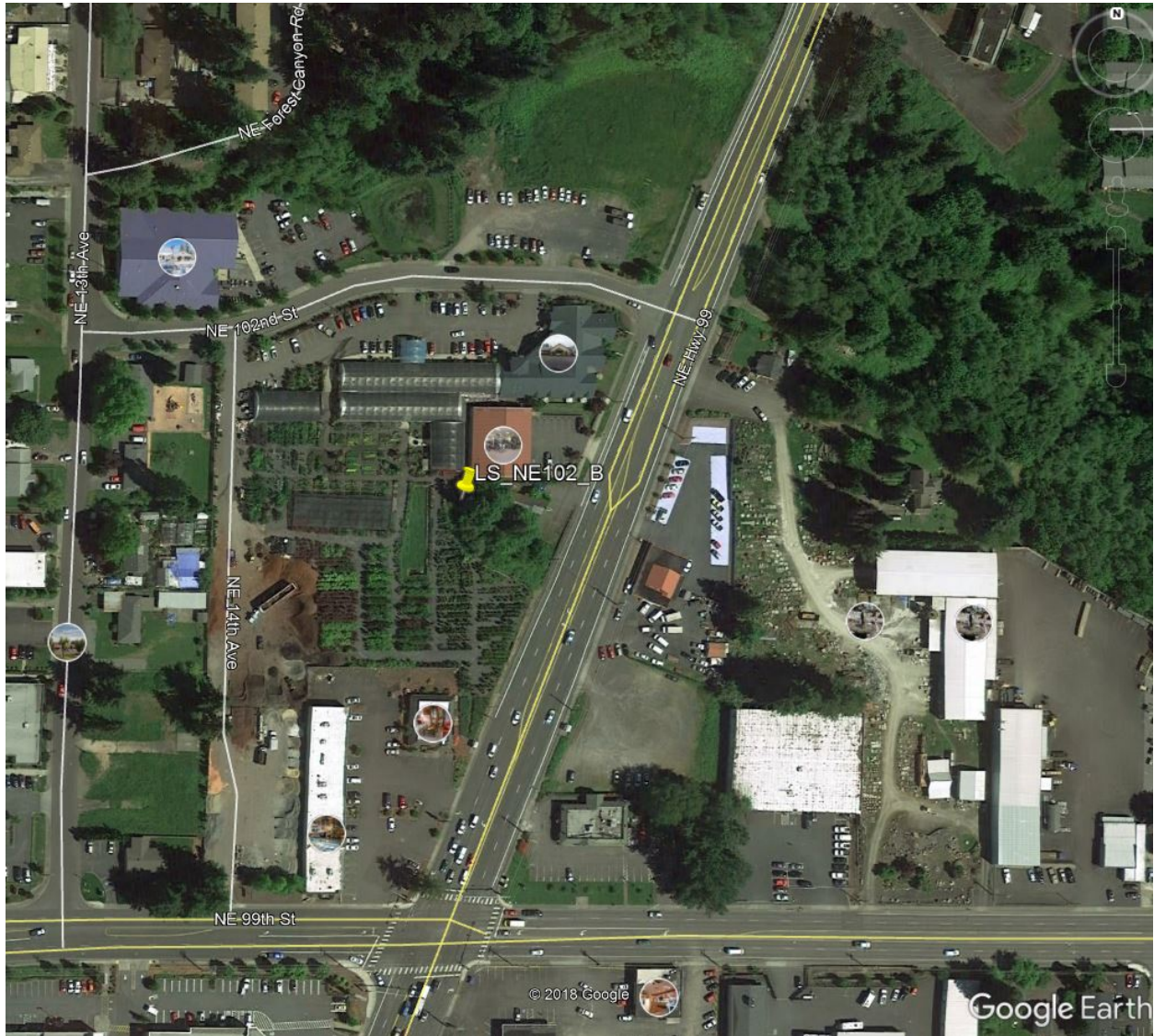
Comments: Looking upstream
(south) of NE 94th Street
downstream along earthen
channel.

2. LS_NE102_A



	<p>Site ID: LS_NE102_A Date: July 12, 2018</p>
	<p>Location: Lower Salmon Creek</p>
	<p>Comments: Looking south at channel and top of culvert. Homeless rubbish covering culvert up. Must remove before sampling.</p>
	<p>Site ID: LS_NE102_A Date: July 12, 2018</p>
	<p>Location: Lower Salmon Creek</p>
	<p>Comments: Homeless rubbish covering culvert up. Must remove before sampling.</p>

3. LS_NE102_B





Site ID: LS_NE102_B
Date: July 12, 2018

Location: Lower
Salmon Creek

Comments: Looking south over bicycle shop fence. Drainage is in old house lot. Nursery owns the lot; received contact info to gain access to the site. Call Tim, or owner Mark: 360-573-7172.



Site ID: LS_NE102B
Date:

Location: Taken from nursery, looking south.

Comments: Cannot see culvert in photo. Looking down vegetated embankment. Need to approach monitoring site from house next door. Must contact nursery to access.

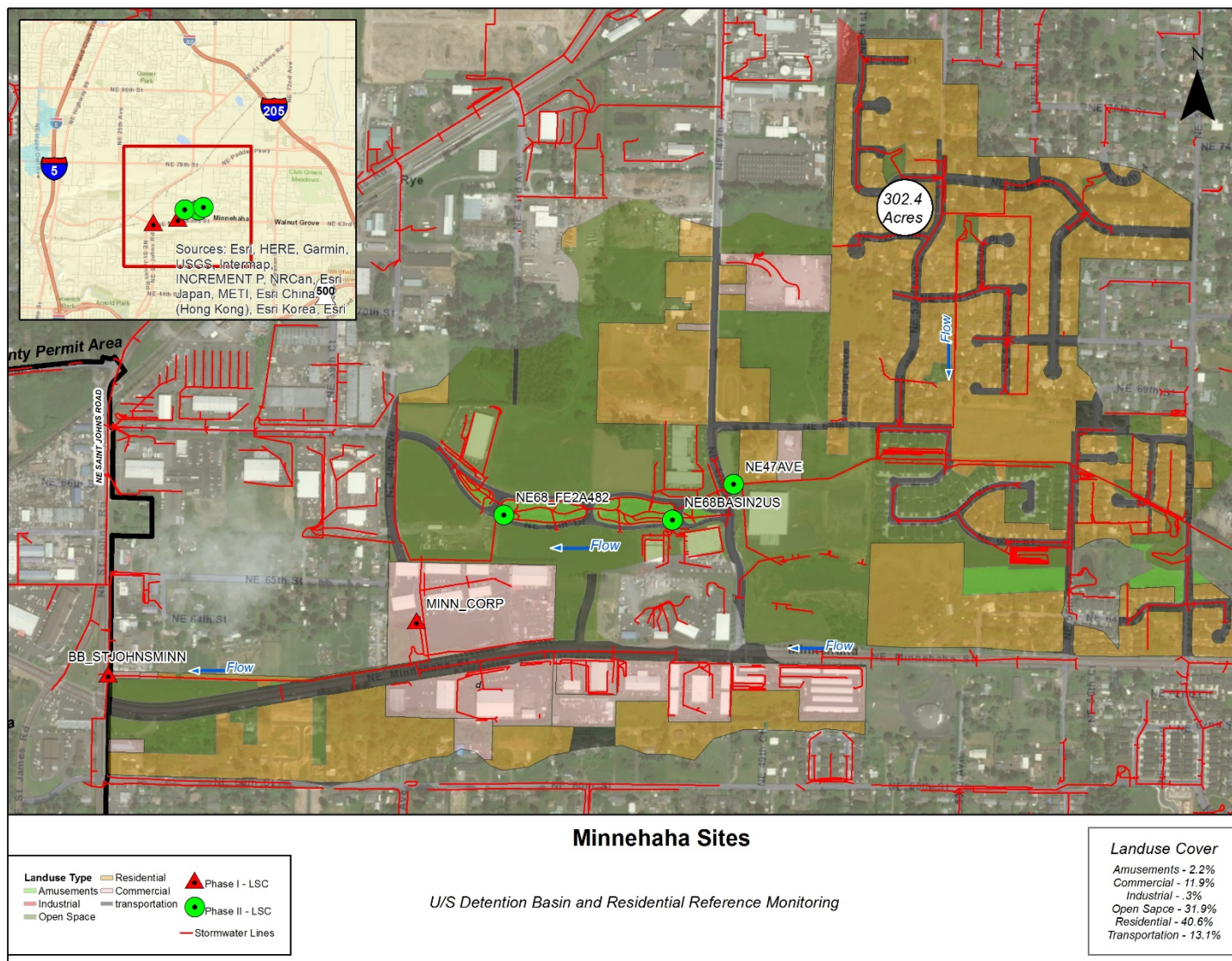
4. LS_NE102_Basin



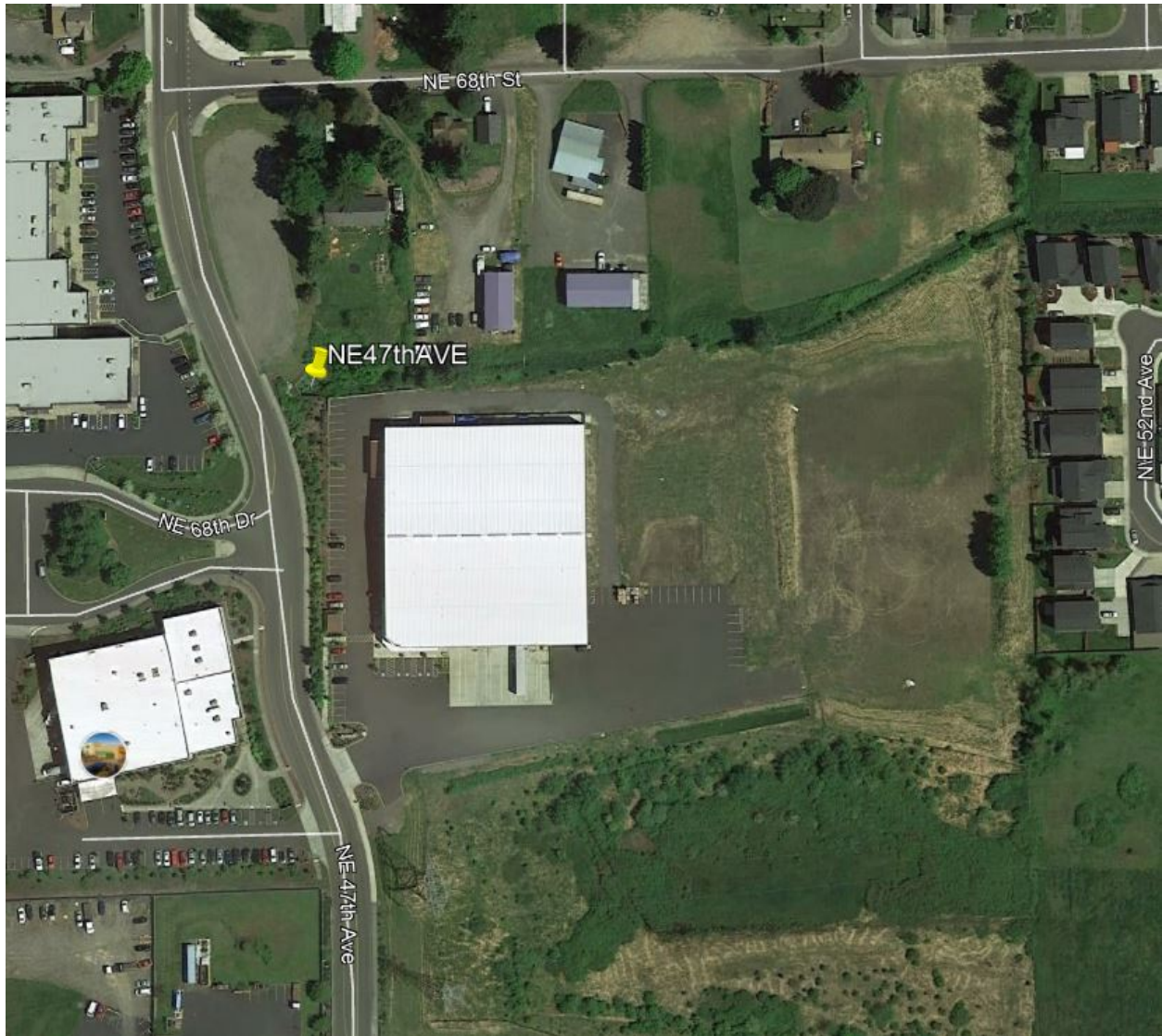


Site ID:
LS_NE102_Basin
Date: July 12, 2018
Location: Lower
Salmon Creek
Comments: Looking
north into detention
basin from nursery
runoff. Potential site.

Minnehaha Sites (Upstream to Downstream)



1. NE47thAVE





Site ID: NE 47th AVE
Date: July 12, 2018

Location: Minnehaha

Comments: Looking at downstream end of basin at culvert. Culvert flows under NE 47th Ave to the west.





Site ID: NE 47th AVE
Date: July 12, 2018

Location: Minnehaha

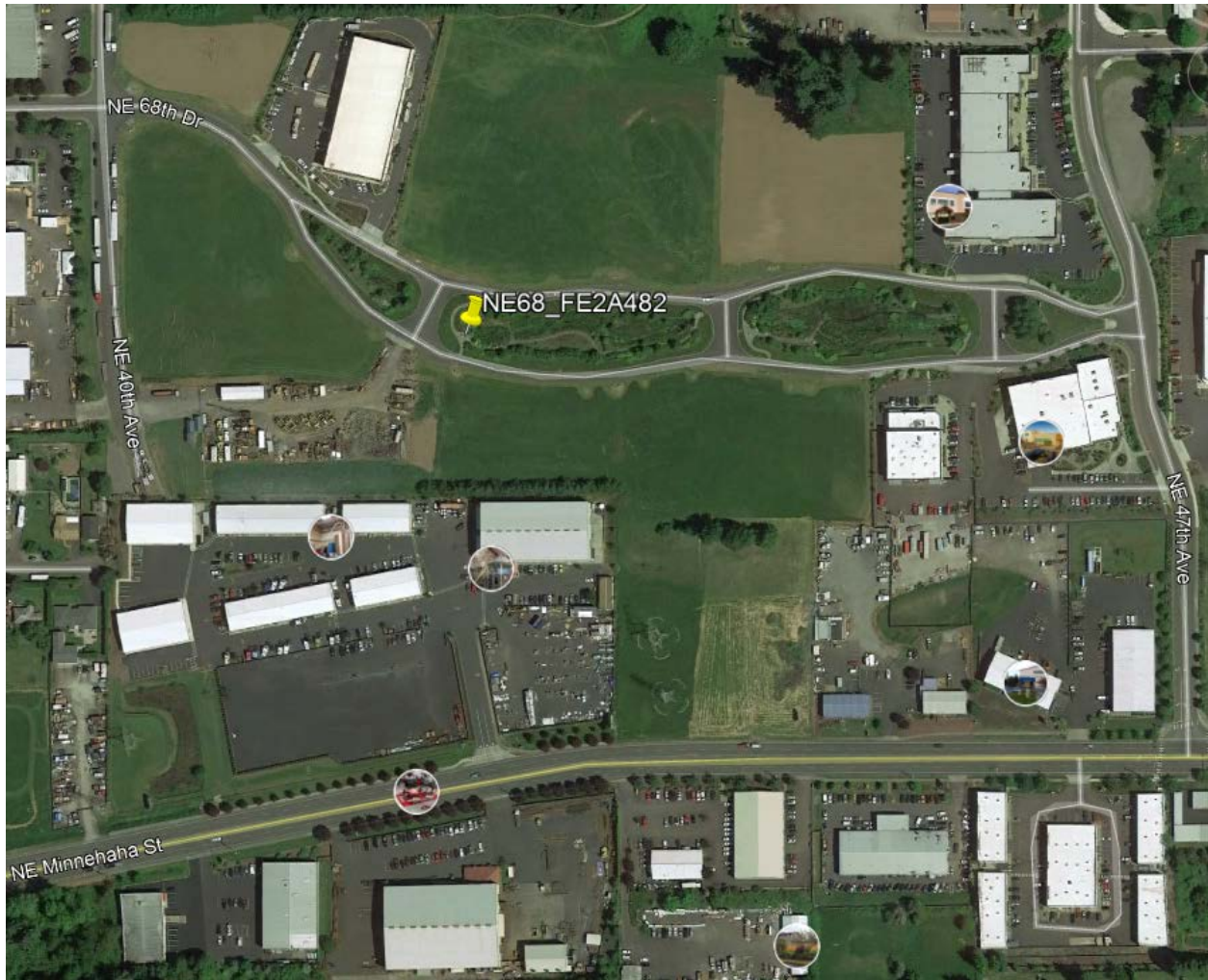
Comments: Looking upstream of the culvert at stream stage gage.

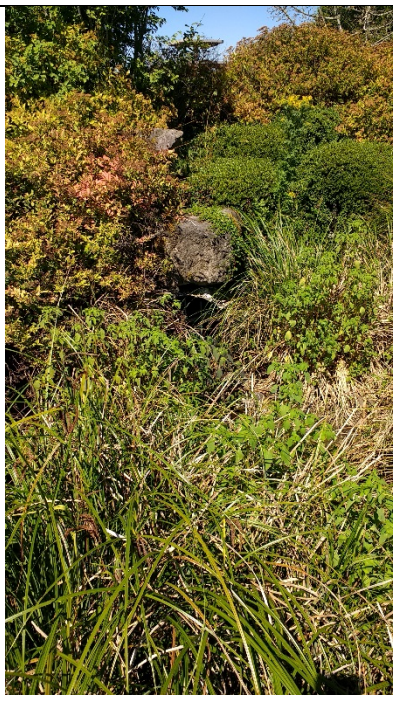

2. NE68BASIN2US



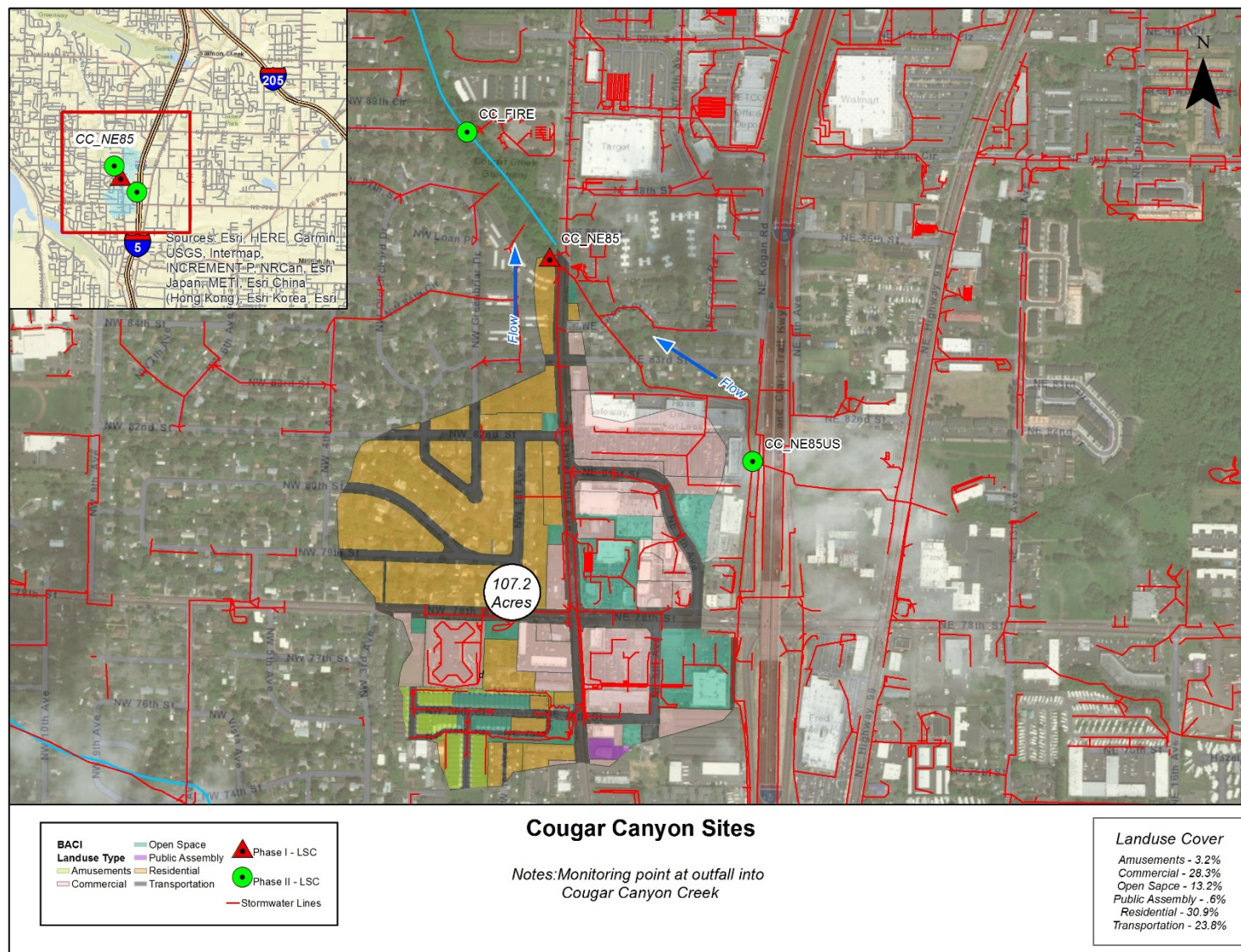
		<p>Site ID: NE68BASIN2US Date: July 12, 2018</p>
		<p>Location: Minnehaha</p>
		<p>Comments: Looking upstream (east) from right bank at inlet of basin 2 (D/S of basin 1).</p>
		<p>Site ID: NE68BASIN2US Date: July 12, 2018</p>
		<p>Location: Minnehaha</p>
		<p>Comments: Looking downstream (west) on right bank near inlet of basin.</p>

3. NE68_FE2A482

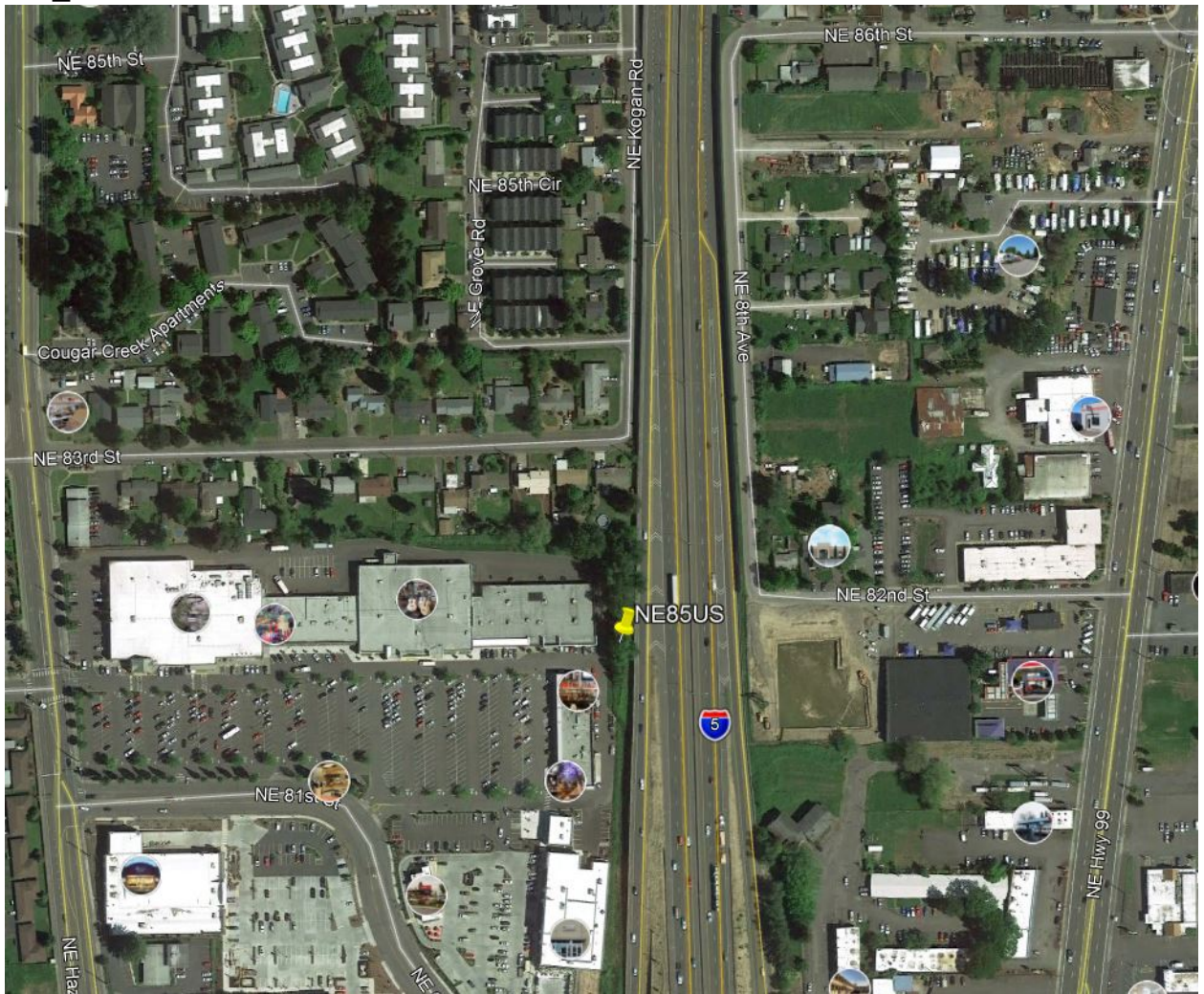


		<p>Site ID: NE68_FE2A482 Date: July 12, 2018</p>	
		<p>Location: Minnehaha</p>	
			<p>Comments: Looking downstream (west) from left bank at outlet of basin 3 (D/S of basin 2).</p>
		<p>Site ID: NE68_FE2A482 Date: July 12, 2018</p>	
		<p>Location: Minnehaha</p>	
			<p>Comments: Looking upstream (east) on left bank along basin.</p>

Cougar Canyon Sites (Upstream to Downstream)

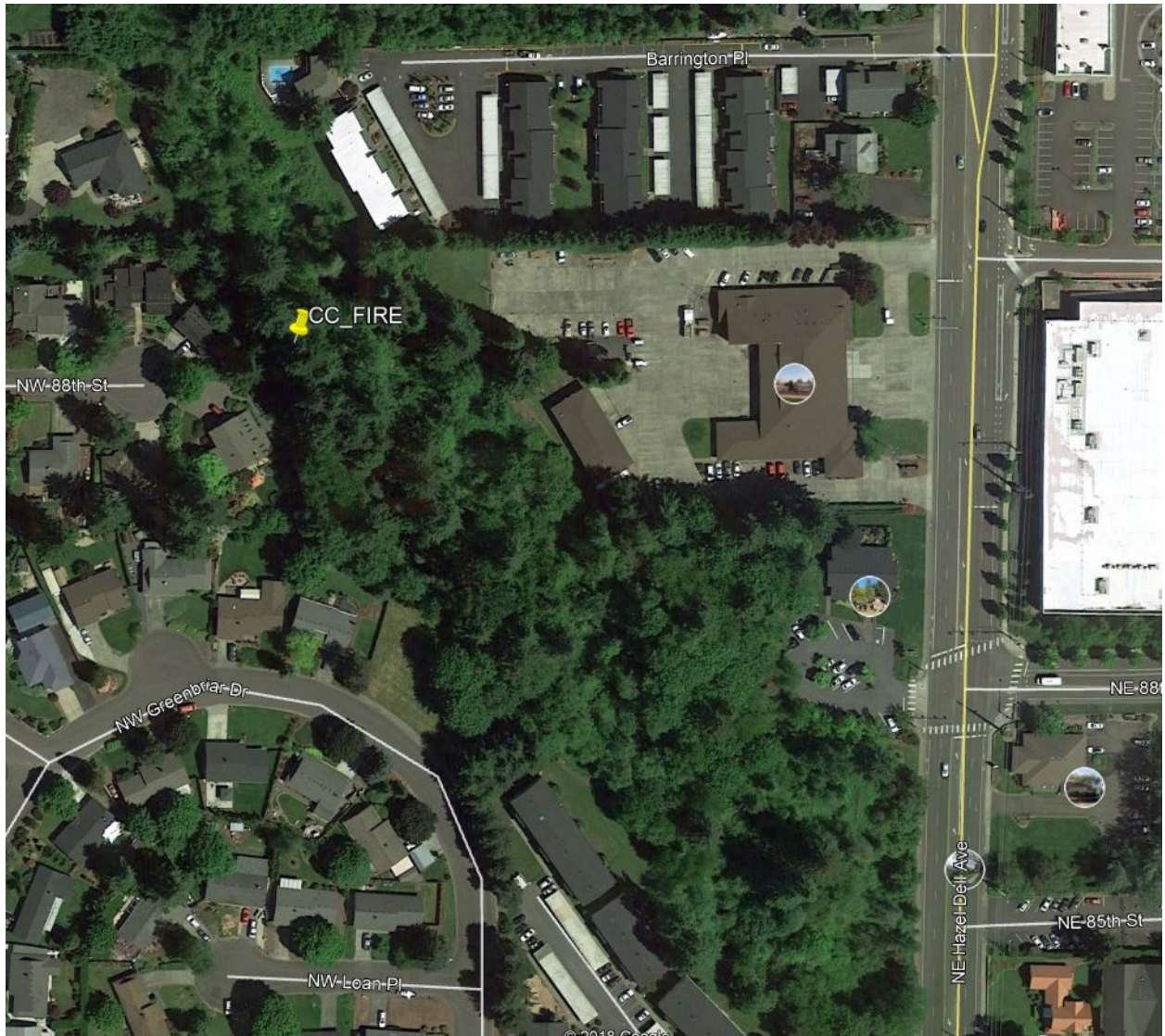




1. CC_NE85US



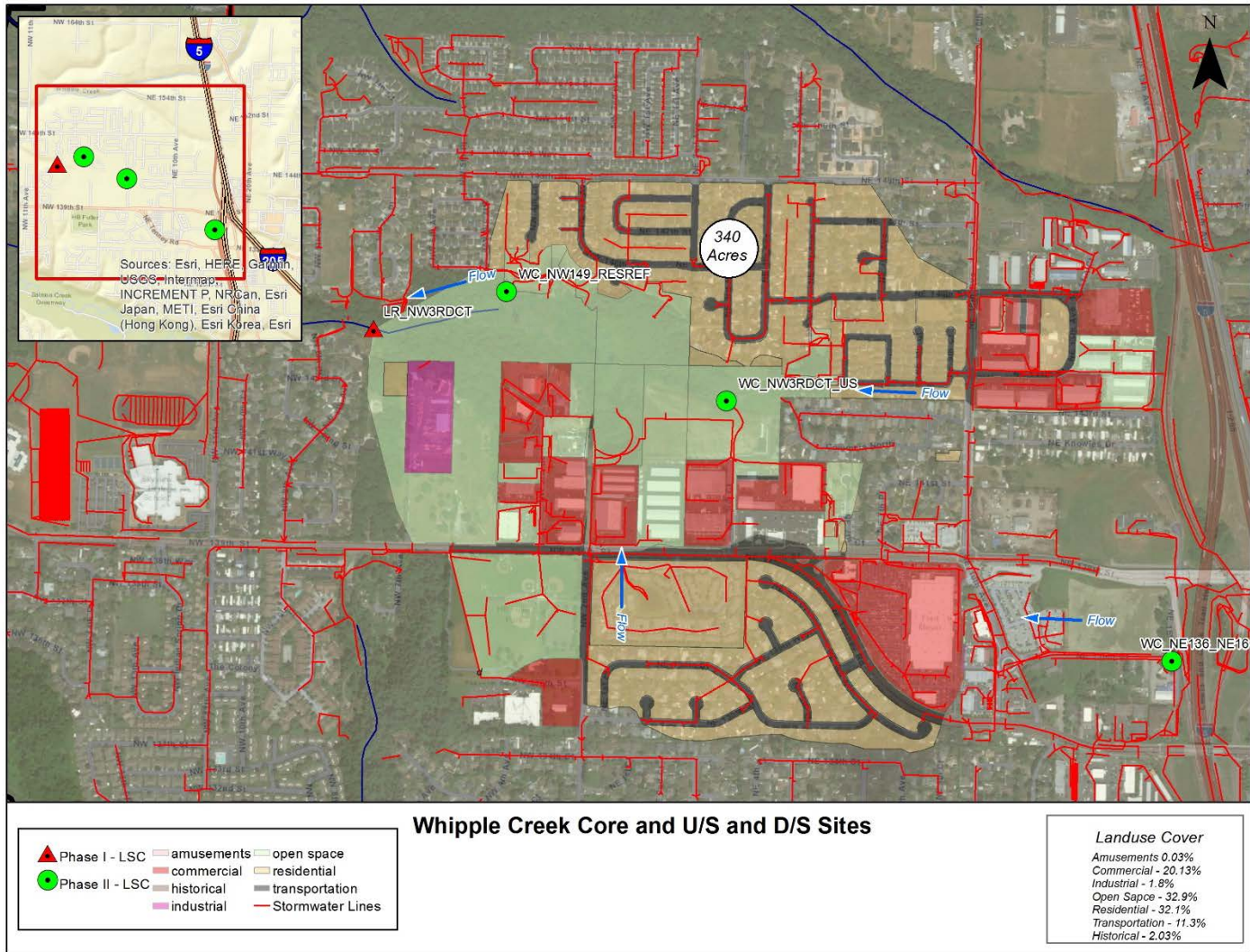
NO PHOTOS	Site ID: NE85_US Date: July 12, 2018
	Location: Cougar Canyon Creek Behind shopping center along I-5
	Comments: Homeless Encampments
NO PHOTOS	Site ID: NE85_US Date: July 12, 2018
	Location: Cougar Canyon Creek Behind shopping center along I-5
	Comments: Homeless Encampments

2. CC_FIRE

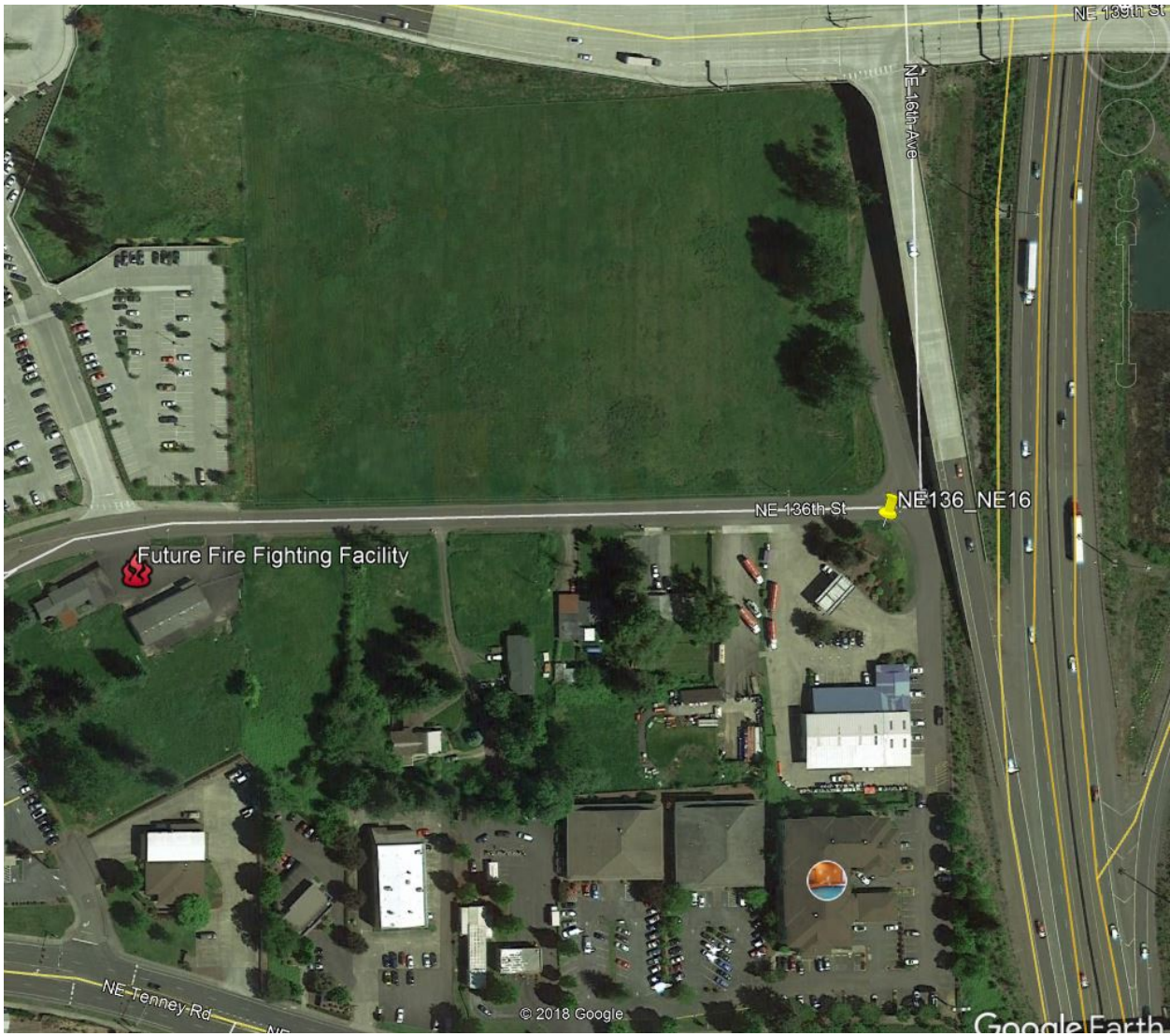




	<p>Site ID: CC_FIRE Date: July 12, 2018</p>
	<p>Location: Cougar Canyon Creek D/S Fire District 6, Station 1.</p>
	<p>Comments: Looking downstream (west) from left bank at outlet of basin 3 (D/S of basin 2).</p>
	<p>Site ID: CC_FIRE Date: July 12, 2018</p>
	<p>Location: Cougar Canyon Creek</p>
	<p>Comments: Looking at right bank of stream bed behind Barrington Place</p>

Whipple Creek (Upstream to Downstream)

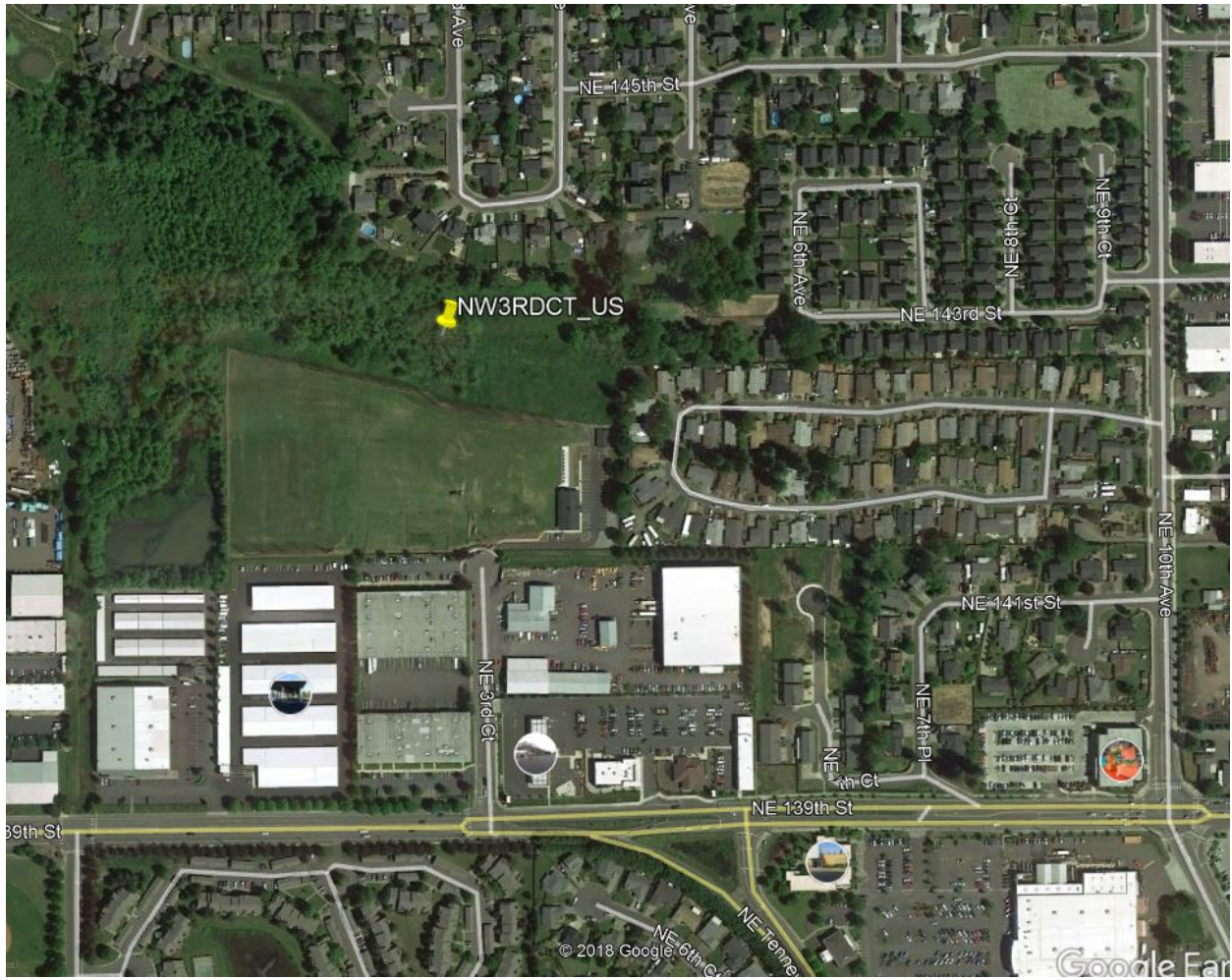


1. WC_NE136_NE16



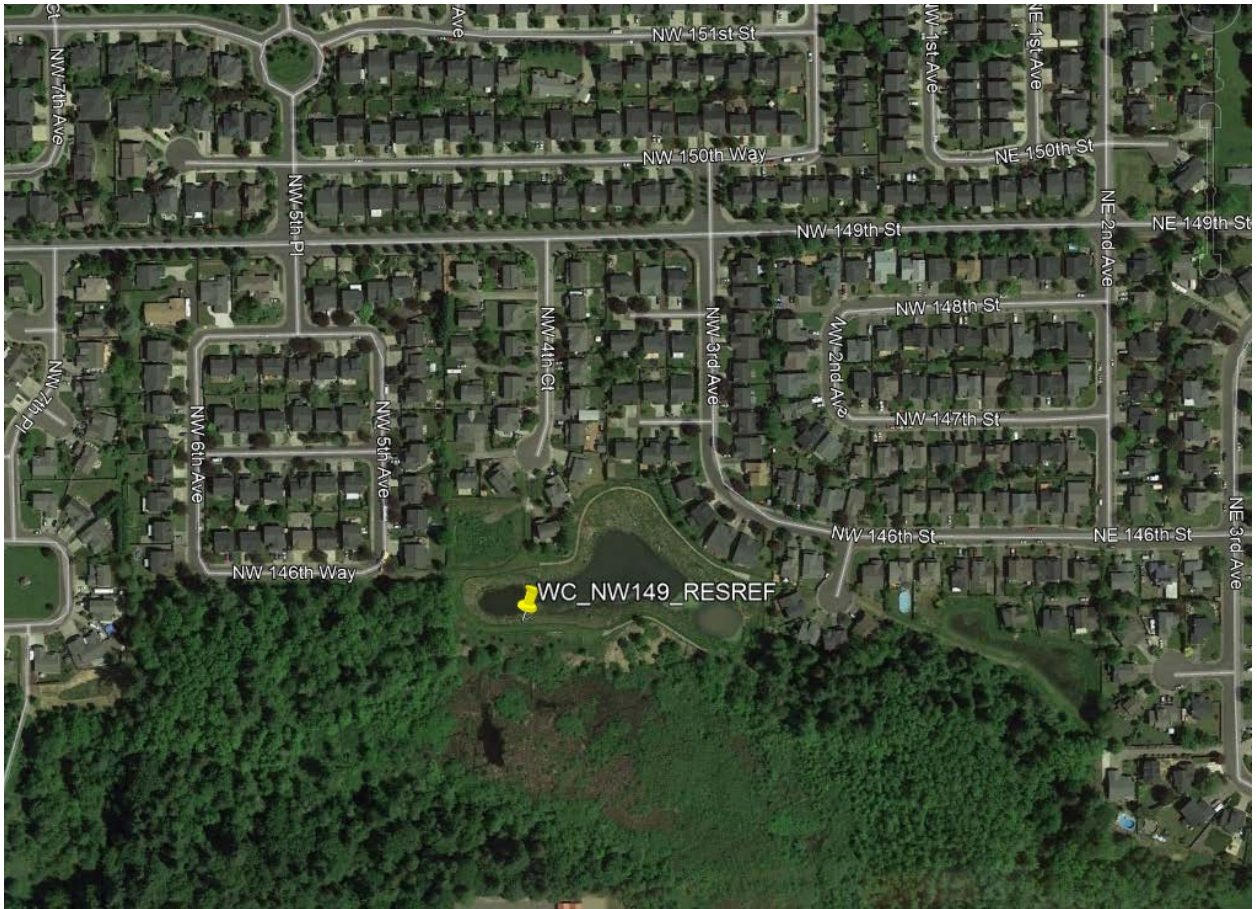
	<p>Site ID: NE136_NE16 Date: July 12, 2018</p>
	<p>Location: Looking downstream at culvert inlet on the SE corner of NE 136th and NE 16th</p>
	<p>Comments: Screening for baseline to compare to post-firefighting activities upstream (PFAS).</p>
	<p>Site ID: NE136_NE16 Date: July 12, 2018</p>
	<p>Location: Looking upstream (west) along roadside drainage ditch.</p>
	<p>Comments: Screening for baseline to compare to post-firefighting activities upstream (PFAS).</p>

2. WC_NW3RDCT_US



NO PHOTOS	Site ID: NW3RDCT_US Date: July 12, 2018
	Location: Tributary to Whipple Creek
	Comments: Drainage from industrial and commercial areas upstream.
NO PHOTOS	Site ID: NW3RDCT_US Date: July 12, 2018
	Location: Tributary to Whipple Creek
	Comments: Drainage from industrial and commercial areas upstream.

3. WC_NW149_RESREF



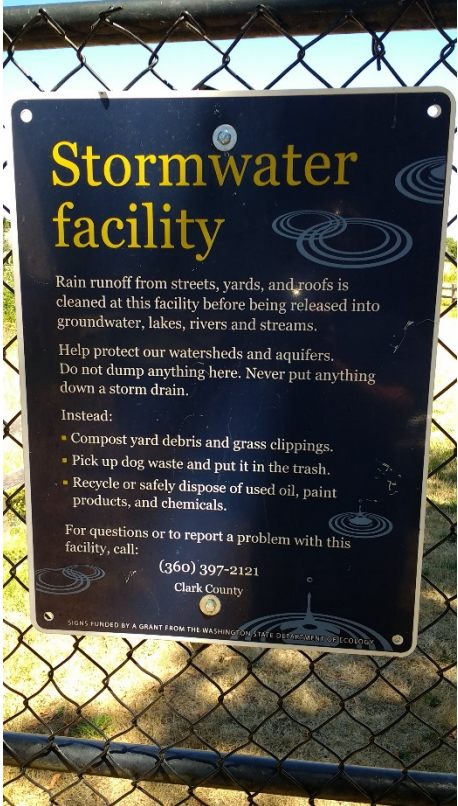


Site ID: NE149_RESREF

Date: July 12, 2018

Location: Looking into detention basin.

Comments: Used to determine residential runoff background.



Site ID: NE149_RESREF

Date: July 12, 2018

Location: Looking at detention basin signage

Comments: County key needed to access facility.