RFQ for Cedar Creek/Juanita Stormwater Retrofit Planning
Job No. 29-20-PW
June 26, 2020

Questions and Answers

Following is the questions and provided answers received by the June 24, 2020 deadline for this project:

1. Could the City please clarify the project budget and funding source? Page 4 of the RFQ indicates $345K and page 15 of the RFQ indicates $492K. Is the project funded by a grant or by the City's surface water utility?

The total cost of the project is estimated at $492,000. The project is funded at 75% of the total by Ecology and 25% of the total by the City's Surface Water Utility. The budget shown in the grant assumes that some City staff time will be charged to the grant. This is why the consultant budget is estimated at $345,000.

2. What is the City's deadline for completing this project, considering the requirements of the grant agreement with Ecology?

There is an error in the grant agreement that we are working to correct. The start date and completion dates for the project are off by 1 year. These dates *should* be a start of July 1, 2020, and a completion of June 30, 2022. The deadline for the consultant team to complete work will be May 30, 2022 - a month or so before the grant completion deadline.

3. Did you have a consultant help you develop the grant application for the project?

No - The application materials were written and compiled by City staff

4. Do you know if there was any consultant support developing King County's HSPF model?

King County Staff and Northwest Hydraulic Consultants (NHC) both conducting modeling work for the King County Juanita Retrofit Study. King County staff focused on development of the HSPF model, and NHC focused on geomorphic analysis.

5. Has any consultant helped the City with the model in the past?

Northwest Hydraulic Consultants have updated and used the model as part of the Totem Lake Stormwater Retrofit Planning project.

6. Will the City require up to 4 soil borings/infiltration tests at each of the 30 potential sites identified or just the 6 prioritized sites?

The budget includes a maximum of 4 soil borings/infiltration tests for the overall projects. The location and nature of those explorations will be determined as part of the site idntification process.

7. Has the City considered, or is it interested in, deep infiltration?

Yes - the City is very interested in deep infiltration. This technique is being used at Kirkland's 132nd Square Park Stormwater Facility, which is expected to go to construction this summer.

8. Is the list of acceptable stormwater facility types developed as part of the North Rose Hill/Forbes project available for review?

With North Rose Hill/Forbes project, we started with a menu of BMP types, and in the end included generalized BMP types in the site selection memo. Both are attached. The purpose of the facility type menu was to narrow the list of facility types that we wanted to consider – for example, our maintenance division has a strong preference for facility types such as canister systems for which they already stock replacement parts.

9. The grant agreement included with the RFQ mentions a list of acceptable facility types developed in the North Rose Hill project. Can you provide that?

With North Rose Hill, we started with a menu of BMP types, and in the end included generalized BMP types in the site selection memo. Both are attached. The purpose of the facility type menu was to narrow the list of facility types that we wanted to consider – for example, our maintenance division has a strong preference for facility types such as canister systems for which they already stock replacement parts.

ATTACHMENTS:

BMP Menu_DRAFT_ForbesRoseHill_2018_523.pdf

ForbesNorthRoseHill_SiteSelectionMemorandum_withAttachments.pdf

BMP Menu
DRAFT dated 5/23/2018
Forbes Creek/North Rose Hill Basin Retrofit Project - Phase 1 (Planning)

BMP Category	BMP		Manuals		Representative Projects	Pros	Cons	TECHNICAL FEASIBILITY: Feasible for Forbes Cr/N. Rose Hill Subbasin?	CITY OF KIRKLAND PREFERENCES: Consider for Forbes Cr/N. Rose Hill Subbasin? (include notes)
	Treatment	Infiltration	Center for WS Protect Urban SW Retrofit Prac Manual	2014 SWMMWW*					
Retrofits	Pond Retrofit		✓	--	--	• Assists in correcting prior design and/or performance deficiencies • Addresses water quality concerns and flood prevention	• Space limitations • May be more costly	Yes	
	Private Retrofits (Expansion of Current Program)		✓	--	--			Yes	
Combination Flow Facility	Combination of Water Quality BMP and Flow Control BMP		--	--	--	• Provides more options to provide water quality and flow control	• Additional maintenance may be needed for two BMP's	Yes	
Bioretention + Infiltration Method	Planter Strip Bioretention with Sloped Sides	Shallow	✓	✓	Numerous	• Preserves the natural water balance • Good retrofit and residential option •Promotes watershed education	• High Maintenance and Landscaping Required • Surface infiltration required for infiltration Method	No	
		Pit/Drilled Drain	✓	✓	Ballard Ph II**			No	
		Deep Well	✓	✓	Barton/Venema**			Yes	
	Planter Strip Bioretention with Single Wall (sidewalk side)	Shallow	✓	✓	SEA Streets/Pinehurst**			No	
		Pit/Drilled Drain	✓	✓	Delridge/Ballard Ph II**			No	
		Deep Well	✓	✓	Venema**			Yes	
	Planter Strip Bioretention with Double Walls	Shallow	✓	✓	--			No	
		Pit/Drilled Drain	✓	✓	Delridge**			No	
		Deep Well	✓	✓	--			Yes	
	Curb Bulb Bioretention with Sloped Sides	Shallow	✓	✓	Numerous			No	
		Pit/Drilled Drain	✓	✓	Herrington Green Streets**			No	
		Deep Well	✓	✓	Barton/Venema**			Yes	
	Curb Bulb Bioretention with Single Wall (sidewalk side)	Shallow	✓	✓	--			No	
		Pit/Drilled Drain	✓	✓	Delridge**			No	
		Deep Well	✓	✓	--			Yes	
	Bioretention Cell	Shallow	✓	✓	--			No	
		Pit/Drilled Drain	✓	✓	--			No	
		Deep Well	✓	✓	--			Yes	

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	Treatment	Infiltration	Center for WS Protect Urban SW Retrofit Prac Manual	2014 SWMMWW*					
Bioretention Variant + Infiltration Method	Bioretention w/ Filterra Media (consider all planter/curb bulb/wall configurations listed above)	Shallow	--	--	Manchester SW Park/Point Defiance* (not within planter strip, centralized facilities)	• Same as above	• Same as above	No	
		Pit/Drilled Drain	--	--				No	
		Deep Well	--	--				Yes	
	Cascading Bioretention (consider all planter/curb bulb/wall configurations listed above)	Shallow	--	--	Broadview Cascades**			No	
		Pit/Drilled Drain	--	--	--			No	
		Deep Well	--	--	Venema**			Yes	
	Silva Cell +Bioretention (consider all planter/curb bulb/wall configurations listed above)	Shallow	--	--	--			No	
		Pit/Drilled Drain	--	--	Ballard Phase II**			No	
		Deep Well	--	--	--			Yes	
	Enhanced Tree Trench (consider all planter/curb bulb/wall configurations listed above)	Shallow	--	--	Pacific Ave, Tacoma/ Aurora Corridor Improvement Project, Shoreline*			No	
		Pit/Drilled Drain	--	--				No	
		Deep Well	--	--				Yes	
Biofiltration + Infiltration Method	Biofiltration (consider all planter/curb bulb/wall configurations listed above)	Shallow	--	--	Machester Stormwater Park* (no infiltration)	• Same as above	• Same as above	No	
		Pit/Drilled Drain	--	--				No	
		Deep Well	--	--				Yes	
Bioswale	Bioswale/Swales		✓	✓	--	• Encourages water infiltration and slows water flow	• Not as effective in extremely flat or steep graded areas •Unable to withstand high water flow	Yes	
Filter Strips	Basic & Narrow Filter Strip Along Roadways or Parking Strips	Shallow	✓	✓	--	• Can be used in combination with other BMP's • Requires low maintenance	• Usually used for smaller Drainage Areas • Can not be used where there are soils that cannot sustain grass cover	No	
	Compost-amended Vegetated Filter Strips (CAVS)	Shallow	✓	✓	--				
Sand Filtration	Basic and Large Sand Filters		✓	✓	--	• Reduces pollution runoff and assists in protecting groundwater quality • Require a small amount of land property	• Typically designed to handle small runoff areas • High maintenance is required to prevent sediment from clogging the filter •The filter media may need replacement over time.	Yes	
	Linear Sand Filter		✓	✓	--			Yes	

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	Treatment	Infiltration	Center for WS Protect Urban SW Retrofit Prac Manual	2014 SWMMWW*					
Infiltration Trench	Infiltration Trench at Parking Lot Perimeter, Median Trench Design	Shallow	✓	✓	--	• Provides removal of fine sediments and pollutants. • Requires a small amount of land property.	• High maintenance required. • Replacement of clogged aggregate will be required if the infiltration trench is not maintained	No	
Reversed Sloped Sidewalks	Reversed Sloped Sidewalks Into Planter Strip		--	✓	--	• Can be used in combination with other BMP's • Low maintenance required	• May not have enough property within the right-of-way for reversed sloped sidewalks	Yes	
Stormwater/Constructed Wetlands	Stormwater Wetlands		✓	✓	--	• Large removal of pollutants.	•Large Amount of Property is Required. •High Maintenance Required.	No	
Proprietary Treatment + Deep Well (GULD Approved)	Enhanced Filterra (in Planter or curb bulb)		--	✓	Numerous	• Can provide shallow treatment in small areas.	• Limited Root growth (if tree is used in Filterra unit)	Yes	
	Enhanced Modular Wetland Systems (in Planter or curb bulb)		--	✓	--	•Can provide shallow treatment in small areas	• High maintenance required	Yes	
	Basic Stormfilter (manhole or vault)		--	✓	John Muir Elementary	• Radial cartridges can fit inside stormwater structures	• Cartridges will eventually require replacement	Yes	
	Enhanced Media Filter Drain (Ecology Embankment)		--	✓	--	• Can be used in sheet flow and end of pipe applications	• Low to Moderate Maintence Required	Yes	
Permeable Pavements	Porous Asphalt/Pervious Concrete Streets	Shallow	✓	✓	High Point**	• Manages Stormwater Runoff and functions as a flood control measure	• High Maintenance is required • Clogging of pore spaces may inhibit performance over time • Soil infiltration is required	No	
	Porous Asphalt/Pervious Concrete Pavement Parking Lots	Shallow	✓	✓	--				
	Permeable Pavement Parking Strip/Bike Lanes	Shallow	✓	✓	Numerous				
	Pervious Concrete Sidewalks	Shallow	✓	✓	NW Seattle**				
	Permeable Interlocking Concrete Pavement (PICP)	Shallow	✓	✓	--				
	Plastic or Concrete Grid Pavements	Shallow	✓	✓	--				

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	Treatment	Infiltration	Center for WS Protect Urban SW Retrofit Prac Manual	2014 SWMMWW*					
Full Dispersion	Full Dispersion	Shallow	--	✓	--	• Uses surface grading to avoid concentrating flows or to disperse flows over vegetation • Low maintenance	• Sheet flow must be maintained • Natural dispersion areas must be protected from future development	No	
Pond	Wet Pond		✓	✓	--	• Manages Stormwater Runoff and functions well as a flood control measure	• Large Amount of Property Is Needed	Yes	
	Dry Pond		✓	✓	--			Yes	
	Infiltration Pond	Shallow		✓	--			No	
Tank	Detention Tank/Pipe		--	✓	--	• Property at grade can be used since tank is located below grade	• May be more difficult to maintained due to the size of the pipe	Yes	
	Infiltration Tank/Pipe	Shallow	--	✓	--			No	
Vault	Dry Detention Vault		--	✓	--	• Property at grade can be used since tank is located below grade • Customizable to the restraints of a project. • Maximizes storage space.	• Usually more costly than installing ponds and tanks.	Yes	
	Wet Detention Vault			✓	--			Yes	
	Sand Filter Vault		--	✓	--			Yes	
	Infiltration Vault	Shallow	--	✓	--			No	
Tree Planting	Plant New Trees		--	✓	Numerous	• Aesthetic Benefit, Reduces Stormwater Runoff, Prevents Soil Erosion, Reduces Air Pollution, Improves Water Quality	--	Yes	

* BMP's listed can also be found within the 2014 SWMMWW Manual, with the exception of CAVS (Compost Amended Vegetated Filter Strips).
** Projects not within the City of Kirkland

Forbes Creek/N. Rose Hill Basin Stormwater Retrofit Site Identification and Evaluation

PREPARED FOR: Jenny Gaus/City of Kirkland

PREPARED BY: Amy Carlson, PE/CH2M
Jesse Williams, PE/CH2M
Dustin Atchison, PE/CH2M

DATE: January 14, 2019

1.0 Introduction and Background

The City of Kirkland (the City) has requested assistance from CH2M HILL Engineers, Inc. (CH2M) to identify and perform preliminary design on, and develop an implementation plan for, three stormwater retrofit projects in the North Rose Hill Basin within the Forbes Creek Watershed in Kirkland as part of Phase 1 of the Forbes Creek/N. Rose Hill Basin Stormwater Retrofit Project. Phase II (to be funded separately) will integrate the preliminary designs and implementation plans into the next Surface Water Master Plan for construction. Phase III will monitor the projects implemented to measure the progress towards meeting ecological outcomes that support 2020 recovery targets for Puget Sound.

This memorandum describes the process to identify and evaluate potential stormwater retrofit site locations as part of Phase 1 of this project and contains the work products of these activities. This memorandum presents the three (3) sites selected as part of the preferred alternative and will be advanced to the preliminary design stage of this Phase 1 of the Forbes Creek/N. Rose Hill Basin Stormwater Retrofit Project.

2.0 Siting Criteria and Menu of Best Management Practices

Siting criteria and a menu of best management practices were developed ahead of site identification in order to focus and streamline the site identification activities. First, national databases and references were used to develop a list of siting criteria and best management practices. Then, the siting criteria (Table 1) and the menu of best management practices (Table 2) were revised to reflect lessons learned across the Puget Sound and City preferences based on past experiences. Attachment A contains supporting details for the siting criteria (and basis of scoring).

The set of siting criteria includes both criteria to assess feasibility, and also criteria to assess potential benefits. Both types of criteria are included in the criteria set so that the resulting site rating reflects both the feasibility and the potential benefit of the stormwater retrofit.

The primary focus of these stormwater retrofit projects in the North Rose Hill Basin is to provide water quality benefits. The siting criteria include a criterion about providing community benefits. This aligns with a City of Kirkland objective to maximize benefits to the community with investments in stormwater. Including criteria in addition to those pertaining to water quality will yield retrofit projects that provide the greatest benefit across multiple objectives.

Table 1. Siting Feasibility Criteria

Criterion	Basis of Scoring (with scale as 1=worst and 5=best, or most feasible)[1]
Willingness of Owner to Site Project at Location	1=private property with no potential for easement or sale 5=publicly owned property available for use
Engineering Feasibility	1=low engineering feasibility (ex: issues to overcome, at a high cost) 5=highly feasible – no engineering issues
Permitting Feasibility	1=multiple permits required; difficult to obtain 5=no obvious permitting challenges
Amount of Tributary Area (to assess potential hydrologic benefit)	1=no tributary area 5=large amount of tributary area available without additional conveyance
Infiltration Capacity (to assess potential benefit)	1=no infiltration potential 5=both shallow and deep infiltration potential
Potential for Flow Control benefit (to assess potential benefit)	1=no potential for flow control benefit / low capture area 5=high potential for flow control benefit with no additional conveyance needed
Potential for Water Quality benefit (to assess potential benefit)	1=no potential for water quality benefit (low amount of pollutant generating impervious surface) 5=high potential for water quality benefit (large amount of pollutant generating impervious surface)
Potential for Community Benefits	1=no potential for community benefits (open space and/or improved safety) 5=high potential for community benefits

[1] Basis of scoring shown for 1=worst and 5=best; Attachment A contains a full description of the basis of scoring

Table 2. Menu of Best Management Practices

Best Management Practice Category	Description
Storage	Desired benefits: decrease runoff peak flows by attenuating volume Types: pond, vault
Water Quality Treatment	Desired benefits: improve water quality by removing pollutants Types: vault, proprietary treatment device(s)
Infiltration	Desired benefits: decrease runoff peak flows and volumes by infiltrating runoff Types: shallow, deep (such as an Underground Injection Control (UIC) well)
Bioretention (also referred to as rain garden, swale)	Desired benefits: improve water quality by removing pollutants; decrease runoff peak flows by attenuating volume; can promote shallow infiltration if unlined Types: multiple configurations (roadside, curb bulb, etc.); lined or unlined
Inter-basin Flow Transfer [1]	Desired benefits: decrease runoff peak flows and volumes in one basin, shifting those flows to a different basin Types: typically changes made to conveyance system to re-route flows into a different drainage

[1] inter-basin flow transfer might be feasible (from a permitting perspective) between sub-basins of the same creek basin, acknowledging permitting requirements and environmental objectives might not make this desirable BMP

3.0 Community Survey

The first Community Engagement activity was to develop a community survey to gauge level of awareness and support for stormwater retrofit projects, understand existing drainage issues, identify additional community benefits such as traffic calming, and determine stakeholder communication preferences. 23 survey recipients completed the survey online and 101 survey recipients completed the hard copy survey and returned via mail to the City for a total 124 total survey respondents.

Attachment F contains the survey responses and a memorandum summarizing survey results.

4.0 Site Identification

GIS screening was the first step in site identification. Using information available in the City of Kirkland's GIS databases, wetlands (and 225-foot surrounding buffer), liquefaction zones, flood zones, steep slopes, and landslide-prone areas were identified within the North Hill Basin. These areas were screened out as infeasible for stormwater retrofits.

The Consultant team prepared a desktop assessment of infiltration potential within the North Rose Hill Basin based on available information including geotechnical reports on file with the City and Department of Ecology well logs. Figure 1 indicates that deep infiltration potential exists in the eastern half of the basin and low to very low shallow or deep infiltration potential exists in the western half of the basin.

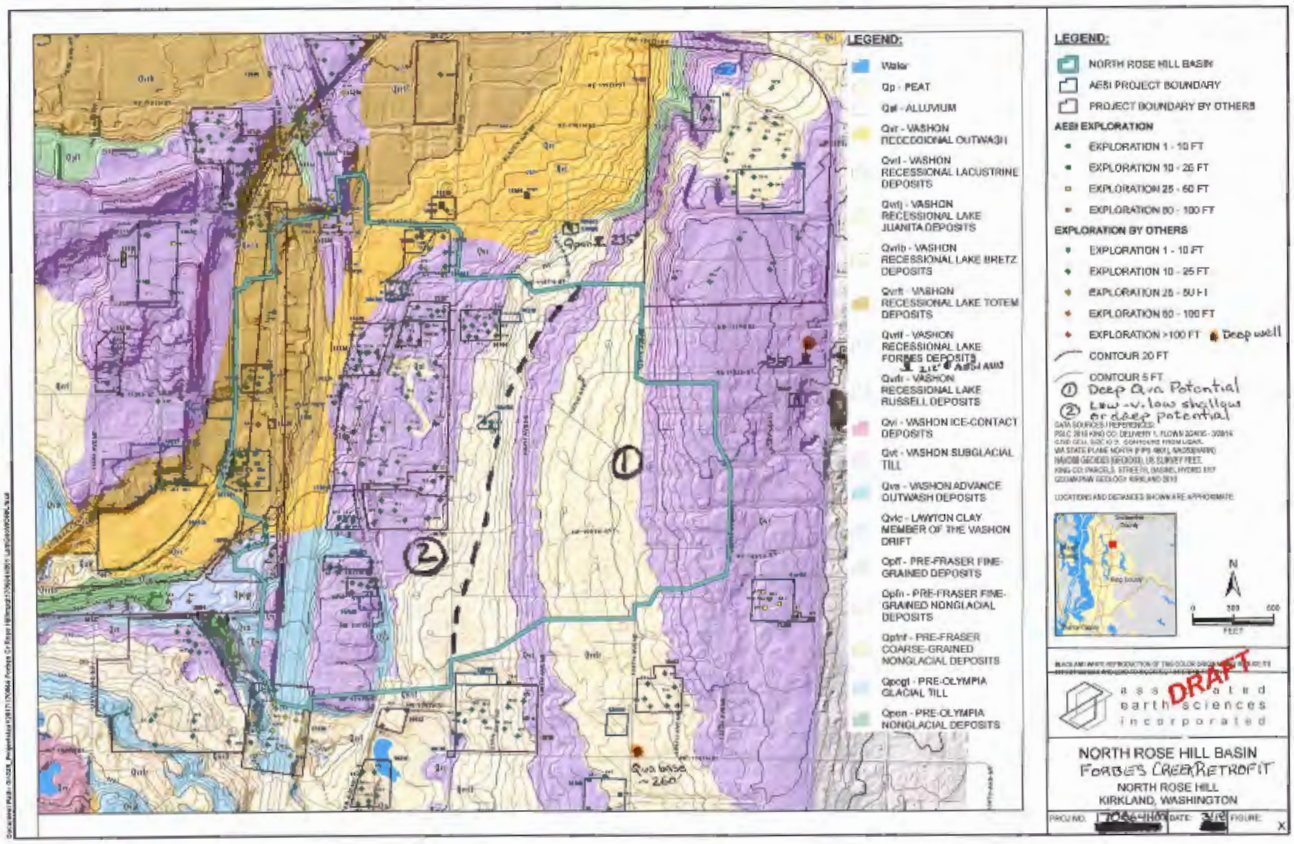


Figure 1. Preliminary Characterization of Infiltration Feasibility

To inform site identification, the existing drainage network and locations of existing stormwater facilities were mapped within the North Rose Hill Basin by the City of Kirkland and provided to the consultant. Locations of these existing facilities are shown on Figure 2.

Figure 2. Existing Stormwater Facilities in the North Rose Hill Basin

CH2M first approached Site Identification using GIS as a model to identify potential locations. Criteria for critical areas, infiltration potential (Figure 1), presence of existing stormwater facilities (Figure 2), and minimum tributary area were used to identify infeasible and non-beneficial areas, with the remaining area as potentially feasible. After reviewing results of what the GIS 'model' produced, CH2M decided to instead use GIS to 'fly over' the basin, working up and down each drainage line to identify sites manually. The Consultant team concluded that while the criteria and 'modeling' approach would be useful to identify opportunities at a large scale, the manual GIS 'fly over' produced the best results for such a relatively small basin.

During site identification, CH2M looked for opportunities just beyond the North Rose Hill Subbasin boundaries because one of the identified BMPs was inter-basin transfer (Table 2). Permitting challenges aside, the team wanted to keep an open mind as to which BMP would be most effective at meeting project goals, especially if benefits could be realized in transferring flows between different sub-basins within the Forbes Creek basin.

CH2M developed three different 'basin-wide' options (Sites U, V, and W) that consist of implementing small-scale storage or water quality treatment wherever feasible throughout the basin. The intent of investigating these basin-wide options is to identify where and how many of these small-scale facilities could be implemented across the basin. The goal would be water quality treatment and flow control of stormwater coming off of streets and rights-of-way.

Using the manual GIS screening, a total of twenty-three (23) potential stormwater retrofit sites were identified. Figure 3 shows the potential site locations identified during the GIS screening stage of this project. Figure 3 does not show the basin-wide potential sites (Sites U, V, and W) nor the sites outside of the North Rose Hill Basin (Sites H, I, J, K, and L).

Each of these 23 potential sites were then evaluated against the siting feasibility criteria shown in Table 1 and given a low (worst), medium, or high (best) site rating. Table 3 summarizes the results of these assessments. Details are provided in Attachment B.

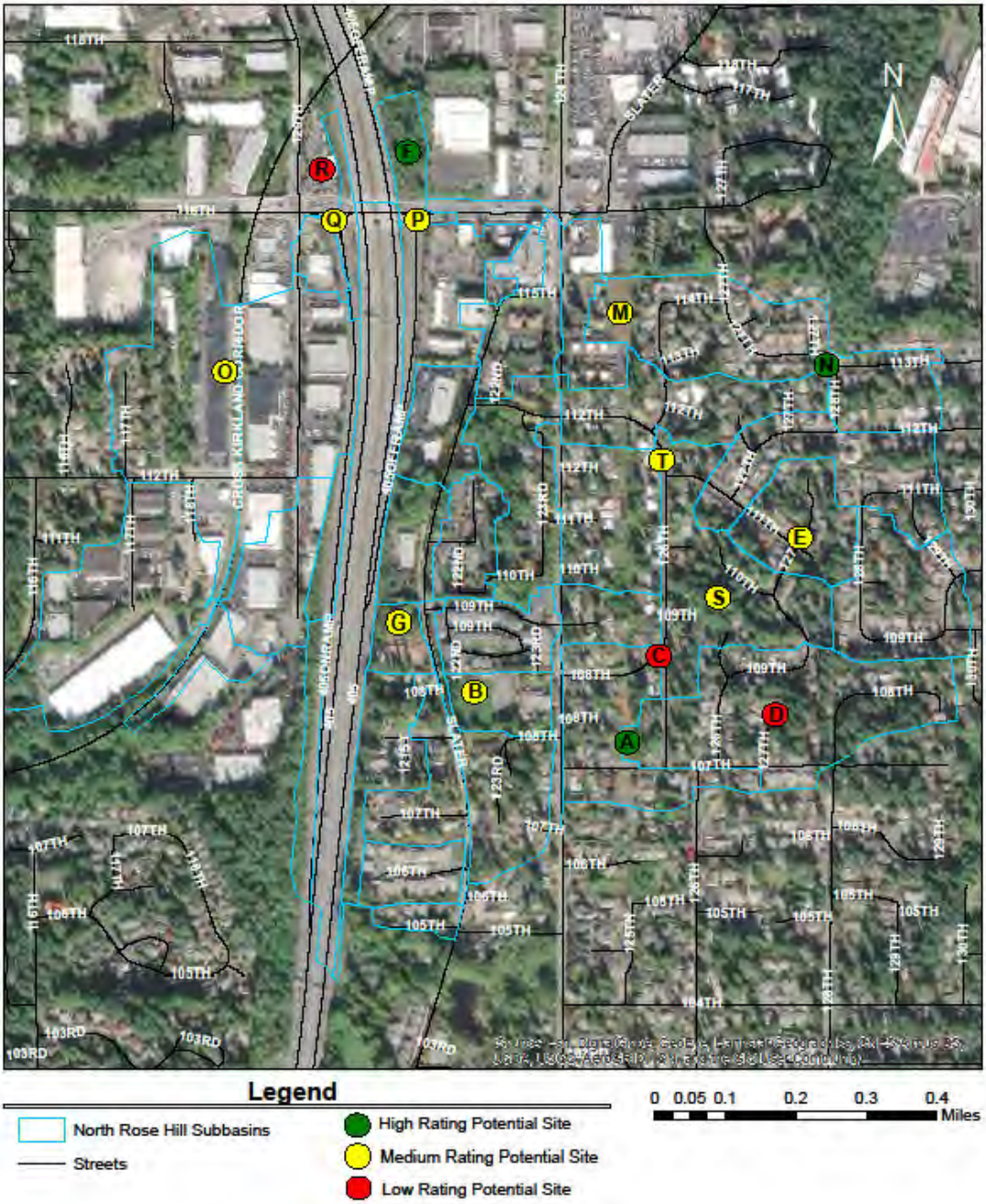


Figure 3. Identified Potential Sites

Table 3. Characterization of Feasibility and Benefits - Sites Identified through GIS Screening[1]

Potential Site ID	Description	Feasibility/Benefit Assessment	Next Steps as Part of this Project
A (Site 1)	**Retention Pond Retrofit @ NE 107th Place**	**High**	**Proceed with further evaluation**
B	**Boys and Girls Club property**	**Medium**	**Proceed with further evaluation**
C	Excess pavement in ROW	Low	No further action (low score)
D	Opportunities in the ROW	Low	No further action (low score)
E (Site 2)	**Water Quality Treatment and Infiltration @ NE 111th Place/127th Place NE**	**Medium**	**Proceed with further evaluation**
F	Open space proximate to I-405	High	No further action (pursue opportunistically)
G	Open space proximate to I-405	Medium	No further action (pursue opportunistically)
H	Mark Twain Park	Not assessed	no further action (outside of basin)
I	ROW along 132nd Ave NE	Not assessed	no further action (outside of basin)
J	Fire Station 26	Not assessed	no further action (outside of basin)
K	Mark Twain Elementary School	Not assessed	no further action (outside of basin)
L	Private property (NE 105th Pl and 126th Ave NE)	Not assessed	no further action (outside of basin)
M (Site 3)	**Retention Facility @ NE 114th Place / 126th Ave NE**	**Medium**	**Proceed with further evaluation**
N (Site 4)	**Water Quality Treatment @ NE 113th Place / 128th Ave NE**	**High**	**Proceed with further evaluation**
O	Private property (NE 112th St and ERC)	Medium	No further action (pursue opportunistically)
P	ROW at NE 116th St and I-405 offramp	Medium	No further action (pursue opportunistically)
Q	ROW at NE 116th St and I-405 onramp	Medium	No further action (pursue opportunistically)
R	Private property at NE 116th St and Eastside Rail Corridor	Low	No further action (pursue opportunistically)
S	City of Kirkland owned open space east of 126th Ave NE / NE 109th Pl	Low (revised from Medium)	No further action (low score)
T (Site 5)	**Bioretention and Infiltration @ 126th Ave NE**	**High (revised from medium)**	**Proceed with further evaluation**
U	Basin-wide implementation of green stormwater infrastructure	High	Map extent of feasibility of this basin-wide option
V	Basin-wide implementation of flow control where feasible	Medium	No further action (focus on other two basin-wide options)
W	Basin-wide implementation of water quality (vaults and UIC wells)	Medium	Map extent of feasibility of this basin-wide option

[1] Attachment B contains details of the characterization of feasibility and benefits for all sites identified through GIS screening

Draft feasibility and benefit assessments were proposed to the City of Kirkland in a workshop setting on August 8, 2018. The assessments for potential sites S and T were revised based on those conversations. At this same workshop, the City of Kirkland provided direction on next steps, outlined in Table 3 and summarized here:

- Proceed with further evaluation on six (6) sites: A, B, E, M, N, and T (See Attachment B for a table showing revised scores for these top six (6) sites based on the conversations during the August 8, 2018 workshop)
- Map the extent of feasibility of implementing these basin-wide options: U and W (see Attachment C for summary of these analyses, intended to provide context to City of Kirkland on where water quality treatment and/or bioretention might be feasible on a small scale throughout the North Rose Hill Basin); The flow control and water quality problems of the North Rose Hill Basin would likely not be solved in entirety with these small-scale facilities because space and infiltration capacity is limited. Therefore, larger-scale facilities would still be needed. The focus of this project moving forward will be on the larger-scale facilities and City of Kirkland will pursue these smaller-scale facilities outside of this project through on-going and potential future projects
- No further action as part of this project:
    - C, D, S, and system-wide V (due to low or medium/low scores)
    - H, I, J, K, and L (located outside of the North Rose Hill Basin, City of Kirkland to consider opportunistic retrofits independent from this project)
    - F, G, O, P, Q, and R (City of Kirkland to pursue stormwater retrofits opportunistically in coordination with re-development or as other entities such as Sound Transit, WSDOT, or King County make investments in the area)

5.0 Site Evaluation and Selection

Once the number of sites was narrowed down to six (6), additional field evaluations were conducted and included recording of visual observations and taking photographs. Field Evaluation logs for the top six (6) sites are included in Attachment D.

The detailed field evaluations were then used to determine the best management practice(s) best suited for each site from the menu of best management practices. Concept-level sketches were developed for each site. These concept-level sketches were presented to the City of Kirkland at a September 5, 2018 workshop. The City of Kirkland provided feedback on the concepts for each site.

At the September 5, 2018 workshop, the City of Kirkland decided that site B (Boys and Girls Club property) should be dropped from consideration moving forward because of feasibility. From visual observations, it is likely that wetlands exist proximate to the property. The property is currently privately owned and re-development, and the timing of that re-development, is uncertain. While the site might be feasible from an engineering perspective, the likely permitting and land acquisition (or easement) requirements make it likely more expensive and less desirable than the other top sites. As a result, the City of Kirkland provided direction that CH2M should focus on updating concepts for sites A, E, M, N, and T moving forward.

CH2M then used the feedback received from the City of Kirkland at the September 5th, 2018 workshop to update the concepts for the top five (5) sites and to prepare Fact Sheets, one for each site. Fact Sheets are included in Attachment E. To ease in communications within the team and with the public, the letter identification of each of the top five (5) sites were changed to numbers, with A renamed to 1, E to 2, M to 3, N to 4, and T to 5. Figure 4 shows a map of these top five (5) sites.

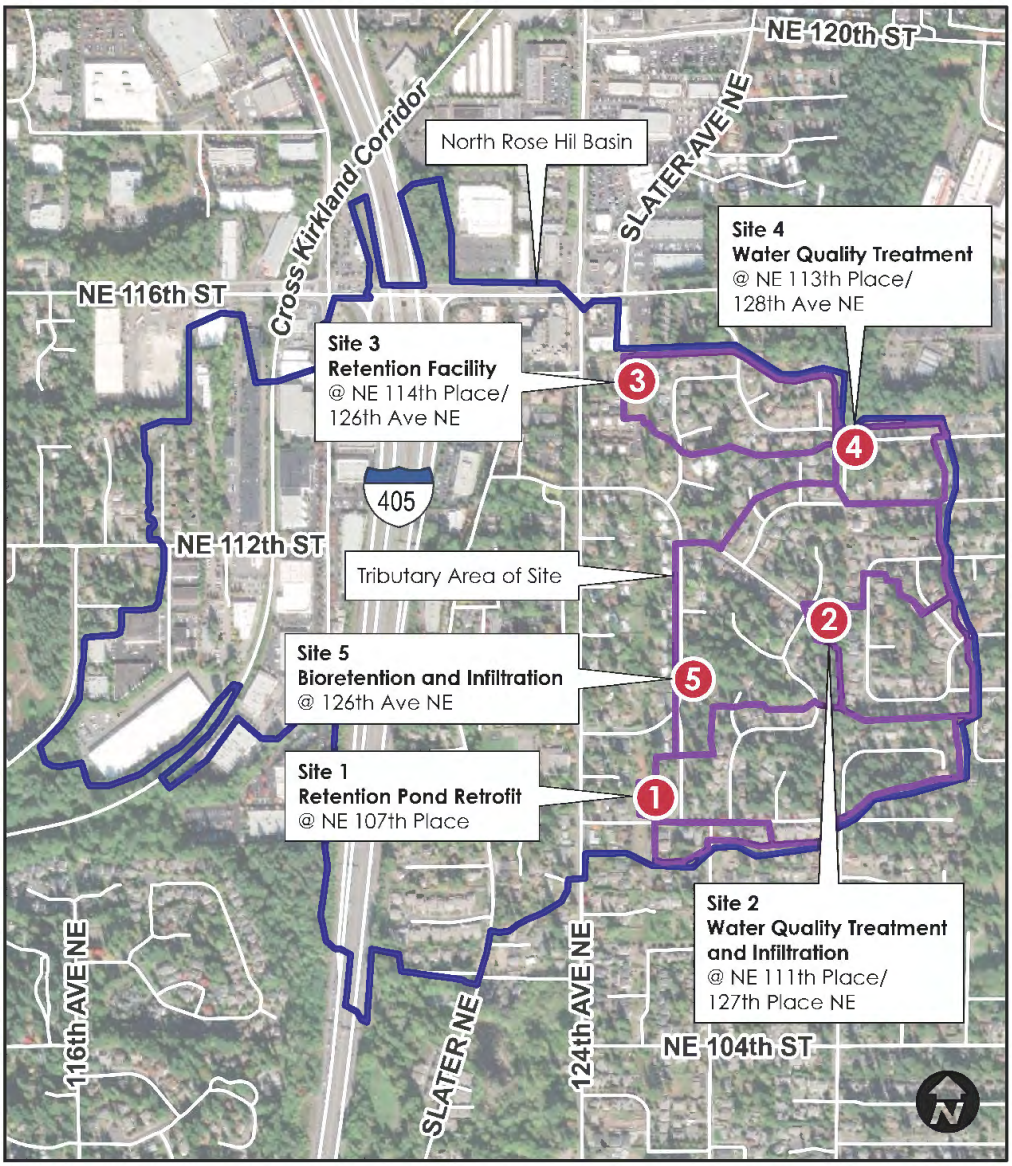


Figure 4. Top Five (5) Potential Sites Identified in the North Rose Hill Basin

Once these top five (5) sites were identified, the City of Kirkland and Engagement consultant Cascadia Consulting Group facilitated the public engagement activities including a 'pop-up charrette', door-to-door engagement, and posting materials to the project website. Materials produced for these engagement materials are included in Attachment F.

The pop-up charrette was held in the North Rose Hill Basin on Saturday October 13th. Because the concept for Site 5 called for modifications of the public right-of-way that might impact parking and travel lanes, the City requested door-to-door outreach at that location, which was held on Wednesday October 10th. An online open house was also held over a several-week period to maximize opportunities for the public to provide feedback. Table 4 includes a summary of the feedback received from the public during this process, with details included in Attachment F.

Table 4. Summary of Feedback from Public Engagement Process

Site	Feedback
1	Currently the site isn't used by the public; desire for native plants (with more hummingbird and bee habitat) and passive use (benches, etc.); site might see use as neighborhood open space if more inviting; Local residents state that gutter flow occurs during storms west along the south side of 107th, which could be intercepted and routed into the pond
2	No objections to this site; some interest in signage or other features to promote stormwater education
3	Strong response from residents proximate to the site; don't want this site to be used as 'travel through' area from down below (bars, etc.); residents might use this area for passive recreation depending on what's put there
4	No objections to this site; some interest in signage or other features to promote stormwater education
5	Strong feedback (both positive and negative); Don't want to lose any parking; desire to maintain two travel lanes (one in each direction); Interest in sidewalks but not at the expense of parking, etc. Established landscaping lines a portion of 126th (old rhododendrons, trees); Desire to implement stormwater management in this area but don't want to lose their current uses of the right of way (transportation, landscaping).

The feedback received was in support of a project at Site 1 (retrofit of existing pond) and neutral about projects at Sites 2 and 4 (water quality treatment opportunities in the right-of-way). Strong opinions, both positive and negative, were expressed about Site 3 (new facilities in City-owned open space) and about Site 5 (improvements in the right-of-way along 126th).

A workshop was held on November 5th, 2018, during which the City of Kirkland decided that Sites 1, 2, and 5 would be brought forward to 30% design as part of this project. The following was the rationale used to inform that decision-making:

- **Site 1 (Selected): Retention Pond Retrofit @ NE 107th Place – potential to be highly beneficial for water quality and peak flow reduction using existing infrastructure; interest from the public in amenities such as open space, native vegetation; feedback from the public was positive; coordination with Seattle City Light (regarding overhead transmission lines) will be required, regardless of changes made to existing pond (larger footprint and/or deeper pond)**
- **Site 2 (Selected): Water Quality Treatment and Infiltration @ NE 111th Place/127th Place NE – potential to provide water quality benefits and peak flow reduction; feedback from the public was positive; chosen to maximize the amount of tributary area managed; Area treated by Site 2 is tributary to Site 5; since Site 5 is space constrained, is of interest to treat as much area at Site 2 to minimize treatment needs at Site 5**
- Site 3 (Not Selected): Retention Facility @ NE 114th Place / 126th Ave NE – while has the potential to be highly beneficial in terms of water quality, peak flow reduction, and provide community benefits (such as open space); however, will require significant public and stakeholder engagement ahead of 30% design to maximize these benefits and address concerns, and significant coordination with Seattle City Light regarding overhead transmission lines and the feasibility of changing parcel usage from open space to stormwater facility (Recommend that City of Kirkland pursue this project in parallel to the three others chosen to proceed with 30% design at this time)
- Site 4 (Not Selected): Water Quality Treatment @ NE 113th Place / 128th Ave NE - potential to provide water quality benefits; feedback from the public was positive; however, since Site 4 tributary area flows to Site 3, and since the City of Kirkland is pursuing Site 3 in parallel, would

make Site 4 redundant. Recommend that the City not proceed with this project and instead focus on Site 3.

- **Site 5 (Selected): Bioretention and Infiltration @ 126th Ave NE – potential to be highly beneficial for water quality and peak flow reduction because of large tributary area; Strong response from the public about maintaining street parking and two travel lanes on 126th Ave NE; Proceed with this project but re-think concepts to address concerns of the public and to coordinate with City of Kirkland Transportation Department, including placement of bioretention cells to minimize impact to street parking and considering adding grey stormwater elements along with the green to maintain water quality and peak flow reduction benefits**

One element that informed the City's choice in sites was the Seattle City Light overhead transmission lines proximate to and/or extending over Sites 1 and 3. Because Site 1 is currently a pond and wouldn't require a change in parcel usage like Site 3 would, it is likely that the coordination and requirements at Site 1 would be less, and take less time, than those at Site 3. The City of Kirkland prefers to only pursue one project proximate to the power lines (requiring Seattle City Light coordination) at a time and has directed the CH2M to include Site 1 and not Site 3.

6.0 Next Steps and Recommendations

CH2M's next steps on this project will be to proceed with geotechnical evaluation, survey, and then development of preliminary (30%) design for Sites 1, 2, and 5 and to develop an implementation plan including a proposed funding strategy, permitting strategy, and public engagement strategy. CH2M recommends that the City of Kirkland advance the following activities in the North Rose Hill Basin of Forbes Creek independent from this project:

- Implement small-scale water quality treatment or bioretention cells where feasible throughout the North Rose Hill Basin (identified in the basin-wide efforts as shown in Attachment C) considering both public right-of-way and private property as potential sites; continue to pursue small-scale distributed water quality treatment on private property via an on-going effort and identify opportunities for small-scale distributed flow control facilities on private property
- Continue planning and coordination for a stormwater retrofit project at Site 3 (Retention Facility @ NE 114th Place / 126th Ave NE), including conducting public and stakeholder engagement and coordination with Kirkland Parks Department and Seattle City Light; This project has the potential to provide water quality, peak flow reduction, and community benefits that align with City of Kirkland goals (such as open space)
- Pursue stormwater retrofits west of I-405 opportunistically in coordination with re-development or as other entities such as Sound Transit, WSDOT, or King County make investments in the area (Sites F, G, O, P, Q, and R)
- Consider stormwater retrofit projects at sites identified outside of the North Rose Hill Basin (Sites H, I, J, K, and L)

7.0 Attachments

A Criteria and Basis of Scoring
B Site Identification and Assessment
C Basin-Wide Analyses
D Field Evaluation
E Fact Sheets
F Public Engagement Materials and Feedback

Attachment A
Criteria and Basis of Scoring

	Willingness of Owner to Site Project at Location	EXAMPLES
1	Private Property that would not be willing to sell/provide an easement or public property that is not available for use	
2	Private Property that may be willing to sell/provide an easement and Public Property may be available for use	
3	Private Property where the property is willing to sell/provide easement and public property may be available for use	
4	Potential Public Property (needs verification) that may be available for use	
5	Confirmed Public Owned Property available for use	

	Engineering Feasibility	
1	Low Engineering Feasibility	
2	Low-Medium Engineering Feasibility	Additional structures/pipes required
3	Medium Engineering Feasibility	
4	Medium-High Engineering Feasibility	Low amount of structures required
5	High Feasibility - No Engineering Issues	

	Permitting Feasibility
1	Multiple Permits Required - Difficult to Obtain
2	Multiple Permits Required - Medium Difficulty to Obtain
3	Few Permits Required - Easy-Medium Difficulty to Obtain
4	One or two permits required - Easy to Obtain
5	No Obvious Permitting Challenges

	Amount of Tributary Area
1	No Tributary Area
2	Small Amount of Tributary Area is available
3	Medium amount of Tributary Area available
4	Large amount of Tributary Area is available with installing/re-routing additional conveyance
5	Large amount of Tributary Area is available without installing additional conveyance

	Infiltration Capacity
1	No infiltration potential
2	Site is located on the west side of the basin where there is low shallow/deep infiltration potentia
3	Site is located at the border of both low potential deep infiltration and potential for deep infiltration (additional investigation required
4	Site is located on the east side of the basin where there is potential for deep infiltratior
5	Shallow and deep infiltration potential

	Potential for Flow Control Benefit
1	No Potential for Flow Control Benefit/Low Capture Area
2	Low-Medium Potential for Flow Control Benefit - Re-routing/pipe installation may be required
3	Medium Potential for Flow Control Benefit - Re-routing/pipe installation may be required
4	Medium-High Potential for Flow Control Benefit - Re-routing/pipe installation may be required
5	High Potential for Flow Control Benefit - No re-routing/pipe installation required

	Potential for Water Quality Benefit	
1	Minimal Potential or no Water Quality Benefit	
2	Low-Medium Potential for Water Quality Benefit/Low-Medium Amount of PGISA	
3	Medium Potential for Water Quality Benefit/Medium Amount of PGISA	
4	Medium-High Potential for Water Quality Benefit/Medium-Large Amount of PGISA	Arterial collection
5	High Water Quality Benefit/Large Amount of PGISA	Facility Retrofit that collects a large amount of PGISA

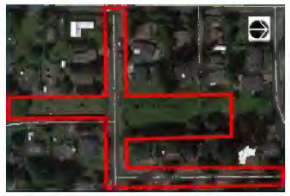
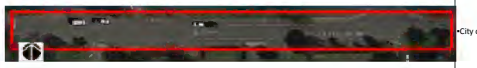
	Potential Community Co-Benefits	
1	No Potential Community Co-Benefits	Elimination of trees/no benefits
2	Low-Medium Potential Community Co-Benefits	Low amount of traffic Improvements and low amount of beautification
3	Medium Potential for Community Co-Benefits	Potential Impact during construction but restoration later
4	Medium-High Potential for Community Co-Benefits	Medium - High Amounts of Traffic Calming/Pond Retrofit
5	High Potential Community Co-Benefits	High Amounts of Traffic Calming/Pond Retrofit

	Overall Site Rating
0 to 1	Low Rating
1 to 2	Low-Medium Rating
2 to 3	Medium Rating
3 to 4	Medium-High Rating
4 to 5	High Rating

Attachment B
Site Identification and Assessment

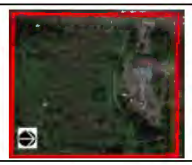
Forbes Creek/North Rose Hill Basin Retrofit Project
Site Selection - Work In Progress

NORTH ROSE HILL BASIN POTENTIAL SITES - List of 20

Potential Site ID	Location	Description	Located within the Basin?	Aerial Photo	Ownership	CH2M Characterization of Feasibility and Benefits (1-5)								Overall Site Rating	Feasibility Assessment	CH2M initial assessment: Low (worst), Medium (let's discuss), High (best!)	Path Forward (after 8/8/18 workshop)
						Feasibility			Benefits								
						Willingness of owner to site project at location	Engineering Feasibility	Permitting Feasibility	Amount of Tributary Area	Infiltration Capacity	Potential for flow control benefit?	Potential for water quality benefit?	Magnitude of potential community (co-benefits)				
A	Southeast of the 124th Ave NE and NE 108th Pl Intersection, located within the boundaries of 124th Ave NE to the East, 126th Ave NE to the West, NE 108th Pl to the North, and 107th Pl to the South.	•This potential site is a combination of four areas including the existing pond area, existing utility easement area, along NE 107th Place, and along 106th Ave NE. •The four individual sites within the combination can also be found listed below.	Yes. (A small portion is slightly beyond the basin area.)		•Private Property •City of Kirkland •City of Kirkland ROW	2 •Residential properties would need to agree to sell their property or provide an easement. •Need to confirm ROW property is available. •Pond retrofit discussion is required with the City of Kirkland.	4	5 •No obvious permitting challenges •Confirmation the existing City of Kirkland pond is not located within a wetland.	4 •A large amount of tributary area is available from the east and north.	4 •Deep infiltration potential.	4	4 •Need to confirm retrofit of the existing pond is possible. •There are no major arterials located within the tributary area.	4 •GSI instead of existing pavement or empty space. •Traffic calming and the beautification of existing pond.	3.86	•This potential site area includes a combination of four areas that would allow for a large amount of flow control and water quality benefit. •Since there is high infiltration potential in this area GSI can also be used within the area. •Obtaining property or an easement from the residential properties may be difficult.	High	top 6
(included in A)	Southwest of the NE 107th Pl and 125th Pl NE intersection.	•This potential site on private property and within a utility easement. •This site is also included within Potential Site A (above).	Yes. (A small portion is slightly beyond the basin area.)		•Private Property	2 •Residential properties would need to agree to sell their property or provide an easement.	4	5 •No obvious permitting challenges.	3 •Tributary area is available from NE 107th Place and east of the site.	4 •Deep infiltration potential.	3 •Need to bring stormwater lines to the south side of the road to gain additional tributary area.	3	4 •GSI instead of empty space.	3.50	•Since there is high infiltration potential in this area GSI can also be used within the area. •Installing additional stormwater infrastructure will allow for additional tributary area. •Obtaining property or an easement from the residential properties may be difficult.	(included in A)	(included in A)
(included in A)	Along 126th Ave NE between NE 108th Pl to the North and NE 107th Pl to the South.	•This potential site includes the ROW area along 126th Ave NE. •This site is also included within Potential Site A (above).	Yes		•City of Kirkland ROW	5 •Need to confirm ROW property is available.	4	5 •No obvious permitting challenges.	3	4 •Deep infiltration potential.	3	3 •Bioretention/ GSI can improve water quality.	4 •GSI within ROW area.	3.88	•Since there is high infiltration potential in this area GSI can be used within the area and provide flow control and water quality benefits. •Pavement can also be removed in the area.	(included in A)	(included in A)
(included in A)	Along NE 107th Pl between 124th Ave NE to the West and 126th Ave NE to the East.	•This potential site includes the ROW area along 107th Pl. •This site is also included within Potential Site A (above).	Yes		•City of Kirkland ROW	5 •Need to confirm ROW property is available.	4	5 •No obvious permitting challenges.	3	4 •Deep infiltration potential.	3	3 •Bioretention/ GSI can improve water quality.	4 •GSI within ROW area.	3.88	•Since there is high infiltration potential in this area GSI can be used within the area and provide flow control and water quality benefits. •Pavement can also be removed in the area.	(included in A)	(included in A)
(included in A)	Northeast of the 124th Ave NE and NE 107th Pl intersection.	•This potential site includes the existing City of Kirkland pond parcel. •This site is also included within Potential Site A (above).	Yes		•City of Kirkland	5 •Pond retrofit discussion is required with the City of Kirkland.	4	5 •No obvious permitting challenges •Confirmation the existing City of Kirkland pond is not located within a wetland.	4 •A large amount of tributary area currently flows into the existing pond.	4 •Deep infiltration potential.	4	4 •Need to confirm retrofit of the existing pond is possible.	4 •Beautification of existing pond.	4.25	•There is a large amount of tributary area flowing towards the existing pond. This pond can be retrofitted to include additional flow and provide additional water quality benefits. •This would also allow for beautification of the existing pond.	(included in A)	(included in A)
B	Southwest of the NE 108th Pl and 124th Ave NE intersection.	•This potential site is located on the Boys and Girls Club private property.	Yes		•Private Property	2 •Boys and Girls club would need to agree to sell a portion of their property or provide an easement.	2 •Additional stormwater infrastructure would be needed.	5 •No obvious permitting challenges.	3 •Additional tributary area can be added to the potential site if additional stormwater infrastructure is installed.	2 •Low shallow or deep infiltration potential.	4 •Medium-High flow control benefit available if additional tributary area is added to the potential site.	4 •Medium-High water quality benefit available since there is potential to collect area along 124th Ave NE and Slater Ave NE.	3 •There will be impacts to the site during construction, but the field will be restored to a condition than existing.	3.13	•Potential detention facility location can be constructed within the private property open field area. •Installing a facility would add additional flow control and water quality benefits. •Additional tributary area can be added to the site if stormwater infrastructure is installed. •There is low infiltration potential at the site.	Medium	top 6
C	NE 108 Pl and 126th Ave NE intersection.	•This potential site is located at large triangular piece of pavement located at the NE 108th Pl and 126th Ave NE intersection.	Yes		•City of Kirkland ROW	5 •Need to confirm ROW property is available.	4	5 •No obvious permitting challenges.	1 •No tributary area available.	4 •Deep infiltration potential.	1 •Low amount of impervious surface can be captured at this location.	1 •Minimal amount of water quality benefit is available.	2 •GSI instead of pavement. •Traffic calming.	2.88	•Removing pavement and installing GIS would allow for traffic calming within the area. •There would be low flow control and water quality benefits since there is little to no tributary area flowing to this location.	Low	no futher action

last revision: 1/10/2019

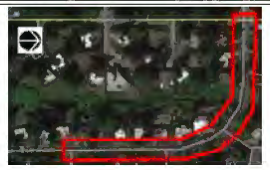
NORTH ROSE HILL BASIN POTENTIAL SITES - List of 20

Potential Site ID	Location	Description	Located within the Basin?	Aerial Photo	Ownership	CH2M Characterization of Feasibility and Benefits (1-5)								Overall Site Rating	Feasibility Assessment	CH2M initial assessment: Low (worst), Medium (let's discuss), High (best!)	Path Forward (after 8/8/18 workshop)
						Feasibility			Benefits								
						Willingness of owner to site project at location	Engineering Feasibility	Permitting Feasibility	Amount of Tributary Area	Infiltration Capacity	Potential for flow control benefit?	Potential for water quality benefit?	Magnitude of potential community (co-benefits)				
D	North of the NE 107th Pl and 127th Ave NE intersection	•This potential site is located at the 127th Ave NE cul-de-sac.	Yes		•City of Kirkland ROW	5 •Need to confirm ROW property is available.	2 •Additional stormwater infrastructure would be needed to increase tributary area.	5 •No obvious permitting challenges.	1 •No tributary area available.	2 •Low shallow or deep infiltration potential.	2	2	1 •Tree removal would be required. •No potential community co-benefits.	2.50	•Removing pavement and installing GIS would allow for traffic calming within the area. •There would be low flow control and water quality benefits since there is little to no tributary area flowing to this location. •Tree removal would be required.	Low	no futher action
E	Intersection of NE 111th Pl and 127th Pl NE	•The potential site is located within the intersection of NE 111th Pl and 127 Pl NE, which is downstream of an existing detention tank system.	Yes		•City of Kirkland ROW	5 •Confirmation is needed to determine if these pipes are located within an easement or ownership.	3	5 •No obvious permitting challenges.	3 •There is approximately 12 acres of tributary area including the area upstream currently being collected by the detention pipe system. •This area does not include high-use streets.	4 •Deep infiltration potential.	2 •There is an existing detention vault system located upstream of these pipes.	3 •There is an existing detention vault system located upstream of these pipes. •Water quality can be improved by adding a water quality structure and UIC well.	1 •No potential community co-benefits.	3.25	•Installing a facility or installing GIS may have little impact to this area since there is a detention vault located upstream of this site area.	Medium	top 6
F	North of the NE 116th St and I-405 off-ramp intersection.	•The potential site is located within the vegetated WSDOT area north of the NE 116th St and 1-405 off ramp intersection.	Yes		•WSDOT ROW	3 •It will need to be determined if WSDOT will offer this property to the City of Kirkland.	3 •Additional stormwater infrastructure would be needed to increase tributary area.	4 •This area is not shown as a wetland area on GIS mapping. Even so, confirmation will be required.	3 •Additional tributary area can be added to the potential site if additional stormwater infrastructure is installed.	2 •Low shallow or deep infiltration potential.	4 •Medium-High flow control benefit available if additional tributary area is added to the potential site.	4 •Medium-High water quality benefit available since there is potential to collect area along 1NE 116th St.	4 •Potential park/beautification area.	3.38	•Installing additional stormwater infrastructure will allow for additional tributary area. •This site may be a wetland or located near a wetland. Further investigation is required.	High	no action pending action by others
G	West of the NE 109th and Slater Ave NE intersection.	•The potential site is at culvert 22 located west of the existing wetland area and the NE 109th and Slater Ave NE intersection.	Yes		•City of Kirkland?	4	2 •This site is within 225 feet of a wetland area.	3 •Expansion of existing wetland would require additional permitting.	3 •Additional tributary area can be added to the potential site if additional stormwater infrastructure is installed.	2 •Low shallow or deep infiltration potential.	3 •Expanding the wetland would assist in alleviating flooding at NE 116th St and along Forbes Creek. •Medium flow control benefit since there is already an existing wetland area.	3 •Rerouting and detaining water within wetland before it discharges into Forbes Creek would provide additional water quality benefits. •Medium water quality benefit since there is already an existing wetland area.	3 •There will be impacts to trees/vegetation during construction, but the open area will be restored to a condition than existing. •Potential park area.	2.88	•This site is within 225 feet of a wetland area. Expansion of this wetland may require additional permitting. •Installing additional stormwater infrastructure will allow for additional tributary area. •Expanding the wetland would provide high flow control and water quality benefits.	Medium	no action pending action by others
H	Southwest of the NE 108th St and 132nd Ave NE intersection.	•The potential site is located within Mark Twain Park.	No		•City of Kirkland	4	3 •Additional stormwater infrastructure would be needed to increase tributary area.	5 •No obvious permitting challenges.	2 •The tributary area is located outside of the basin. •Additional tributary area including 132nd Ave NE could be included if additional stormwater infrastructure is installed.	4 •Deep infiltration potential.	3	2 •There is not much impervious area flowing to the site.	3 •There will be impacts to the site during construction, but the open area will be restored to a condition than existing.	3.25	•The tributary area is located outside of the basin. •Installing additional stormwater infrastructure will allow for additional tributary area. •Water quality benefits would be low since there is not much impervious area flowing to the site. •There would be impacts to the park during construction.	Outside of the Basin	out of basin
I	Along 132nd Ave NE between NE 108th St to the North and NE 104th St to the South.	•This potential site includes the ROW area along 132nd Ave NE.	No		•City of Kirkland ROW	5	4	5 •No obvious permitting challenges.	2 •The tributary area is located outside of the basin. •Per the topographic data, the area between water tower and west side of the road will be collected.	4 •Deep infiltration potential.	3	3 •Bioretention/ GSI can improve water quality.	4 •GSI within ROW area.	3.75	•The tributary area is located outside of the basin. •Since there is high infiltration potential in this area GSI can also be used within the area and provide flow control and water quality benefits. •Additional pavement parking lane can be removed.	Outside of the Basin	out of basin
J	Southeast of the 124th Ave NE and NE 100th St intersection.	•This potential site includes the area located within the Fire Station 26 property.	No		•City of Kirkland	4	3 •This site is within 225 feet of a wetland area.	3 •Southeast portion of property is located within a wetland. Existing area is discharging into the existing wetland.	2 •The tributary area is located outside the basin. •A majority of the surrounding area is discharging into the wetland located on the south side of the property.	4 •Deep infiltration potential.	2 •There is an existing wetland to the south.	2 •There is an existing wetland to the south.	4 •Enhancement of the wetland area/park.	3.00	•The tributary area is located outside of the basin. •This site is within 225 feet of a wetland area. •A majority of the surrounding area is discharging to the wetland located south of the potential site.	Outside of the Basin	out of basin

NORTH ROSE HILL BASIN POTENTIAL SITES - List of 20

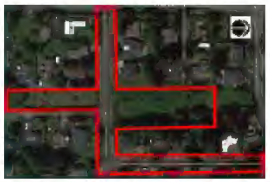
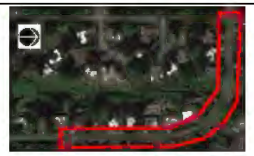
Potential Site ID	Location	Description	Located within the Basin?	Aerial Photo	Ownership	CH2M Characterization of Feasibility and Benefits (1-5)								Overall Site Rating	Feasibility Assessment	CH2M initial assessment: Low (worst), Medium (let's discuss), High (best!)	Path Forward (after 8/8/18 workshop)
						Feasibility			Benefits								
						Willingness of owner to site project at location	Engineering Feasibility	Permitting Feasibility	Amount of Tributary Area	Infiltration Capacity	Potential for flow control benefit?	Potential for water quality benefit?	Magnitude of potential community (co-benefits)				
K	Northwest of the 128th Ave NE and NE 95th St intersection.	•This potential site includes the area located within the Mark Twain Elementary School.	No		•City of Kirkland	4	4	3 Existing area is currently discharging into existing wetland.	2 •The tributary area is located outside the basin. •A majority of the surrounding around is discharging into the wetland located west of 128th Ave NE.	4 •Deep infiltration potential.	2 •There is an existing wetland to the downstream.	2 •There is an existing wetland to the downstream. •There is not much impervious area flowing to this area.	2 •There will be impacts to the site during construction, but the open area will be restored to a condition than existing.	3.00	•The tributary area is located outside of the basin. •There is medium to low flow control and water quality benefits at this location since the site is currently discharging to a downstream wetland. •There will be impacts to the school during construction.	**Outside of the Basin**	**out of basin**
L	Northwest of the NE 105th Pl and 126th Ave NE intersection.	•This potential site is located within an open area found on private property.	No		•Private Property	2 •Private Property would need to agree to sell a portion of their property or provide an easement.	3 •Additional stormwater infrastructure would be needed to increase tributary area.	5 •No obvious permitting challenges.	2 •The tributary area is located outside the basin. •Additional tributary area including 106th Pl and 12th Ave NE could be included if additional stormwater infrastructure is installed.	4 •Deep infiltration potential.	3	2 •There is not much impervious area flowing to the site. •Mo major arterials if we re-route storm conveyance system.	3 •Neighbors may want something more visual appealing in this area.	3.00	•The tributary area is located outside of the basin. •The site has infiltration potential and is located on private property. •Additional tributary area can be obtained by adding stormwater infrastructure. •There will be medium-low water quality benefits since there are no major arterials within the tributary area.	**Outside of the Basin**	**out of basin**
M	East of the NE 115th Pl and 124th Ave NE intersection.	This potential site is located within an open site/park owned by the City of Kirkland.	Yes		•City of Kirkland	4	4 •Within a medium landslide zone or buffer.	5 •No obvious permitting challenges.	4 •Tributary area includes sub-basin area to the east.	2 •Low shallow or deep infiltration potential.	3 •Medium flow control benefit available due to the collection of the sub-basin area.	3 •Neighborhood roads can be treated for water quality, but no major arterials.	3 •There will be impacts to the site during construction, but the open area will be restored to a condition than existing.	3.50	•Within a landslide zone or buffer. •Low infiltration potential within open space/park owned by the City of Kirkland. •Sub-basin area is currently flowing towards this area to detention pipes downstream of the park. • This site could provide medium-high flow control and water quality benefits.	**Medium**	**top 6**
N	Northwest of the NE 113th St and 128th Ave NE intersection.	This potential site is located along NE 11th between 127th Pl NE to the west and 128th Ave NE to the east. The area also includes a small portion of 127th Pl NE and128th Ave NE.	Yes		•City of Kirkland ROW	5	4 •Within a medium landslide zone or buffer.	5 •No obvious permitting challenges.	3 •Medium amount of tributary area from the southeastern sub-basin area.	4 •Deep infiltration potential.	3	3 •Bioretention/ GSI can improve water quality.	4 •GSI within ROW area.	3.88	•Within a landslide zone or buffer. •Since there is high infiltration potential in this area GSI can be used within the area and provide flow control and water quality benefits. •Pavement removal may be possible.	**High**	**top 6**
O	Northwest of the Cross Kirkland Corridor and NE 112th St	This area is located on the Kirkland Business Center private property.	Yes. (A small portion is slightly beyond the basin area.)		•Private Property	2 •Private Property would need to agree to sell a portion of their property or provide an easement.	3 •Additional/ relocation of stormwater infrastructure would be needed or re-direction of flow to proposed facility.	5 •No obvious permitting challenges.	3 •Medium amount of tributary area from the sub-basin and possible additional area to the east.	2 •Low shallow or deep infiltration potential.	4 •Can assist in improving the drainage issues within the area. •May be possible to redirect low-flows.	3 •Parking areas can be treated for water quality, but no major arterials.	1 •No potential community co-benefits. •Large impact to the existing trail.	2.88	•Additional tributary area can be obtained by adding stormwater infrastructure. •The area is located within private property and has medium-high potential for flow control and water quality benefits. •There would be no potential community co-benefits. •Pedestrian path would still be required	**Medium**	**no action pending action by others**
P	At the intersection of NE 116th St and the I-405 off-ramp.	Triangular pavement area located at the intersection of NE 116th St and the I-405 off-ramp.	Yes		•WSDOT ROW	3	3	4 •WSDOT permitting requirements.	3	2 •Low shallow or deep infiltration potential.	3	3	3 •GSI instead of pavement. •Traffic calming.	3.00	•There is low infiltration potential within this area. •Pavement can be removed in the area and replaced with GSI with underdrains. •Medium flow control and water quality benefits could be obtained as well as provide traffic calming.	**Medium**	**no action pending action by others**

NORTH ROSE HILL BASIN POTENTIAL SITES - List of 20

Potential Site ID	Location	Description	Located within the Basin?	Aerial Photo	Ownership	CH2M Characterization of Feasibility and Benefits (1-5)								Overall Site Rating	Feasibility Assessment	CH2M initial assessment: Low (worst), Medium (let's discuss), High (best!)	Path Forward (after 8/8/18 workshop)
						Feasibility			Benefits								
						Willingness of owner to site project at location	Engineering Feasibility	Permitting Feasibility	Amount of Tributary Area	Infiltration Capacity	Potential for flow control benefit?	Potential for water quality benefit?	Magnitude of potential community (co-benefits)				
Q	At the intersection of NE 116th St and the I-405 on-ramp.	Triangular pavement area located at the intersection of NE 116th St and the I-405 on-ramp. Area also includes the pond area southwest of the pavement area.	Yes		•WSDOT ROW	3 •Verification of pond ownership is required,	3 •Re-routing storm would allow for additional tributary area	4 •WSDOT permitting requirements.	3	2 •Low shallow or deep infiltration potential.	4 •Need to confirm retrofit of the pond is acceptable.	4 •May potential be able to provide water quality to I-405 off ramp and NE 116th St.	3 •GSI instead of pavement. •Traffic calming.	3.25	•There is low infiltration potential within this area. •Pavement can be removed in the area and replaced with GSI with underdrains. •Retrofit of the existing pond may be possible. •Medium flow control and water quality benefits could be obtained as well as provide traffic calming. •Additional tributary area can be obtained by adding stormwater infrastructure. •Pedestrian path would still be required.	Medium	no action pending action by others
R	Northwest of the NE 116th St and Cross Kirkland Corridor intersection.	Parking lot area located within private property northwest of the NE 116th St and Cross Kirkland Corridor intersection.	Yes		•Private Property	2 •Private Property would need to agree to sell a portion of their property or provide an easement.	3 Can re-route storm along 120th to proposed facility	5 •No obvious permitting challenges.	2 •The tributary area is located outside the basin. •Low amount of tributary area.	2 •Low shallow or deep infiltration potential.	3	3 •Parking areas can be treated for water quality, but no major arterials.	1 •No potential community co-benefits.	2.63	•The tributary area is located outside of the basin. •Additional tributary area can be obtained by adding stormwater infrastructure. •The area is located within private property and has medium potential for flow control and water quality benefits.	Low	no action pending action by others
S	East of the 126th Ave NE and NE 109th Pl intersection and southwest of the 127th Ave NE and NE 111th Pl intersection.	City of Kirkland Open Space/Park located east of the 126th Ave NE and NE 109th Pl intersection and existing detention pond located southwest of the 127th Ave NE and NE 11th Pl intersection.	Yes		•City of Kirkland	4	3 •Additional stormwater infrastructure would be needed to increase tributary area.	5 •No obvious permitting challenges.	3	4 •Deep infiltration potential.	3 •Installation of a facility/GIS possible since there is deep infiltration potential. •Need to confirm retrofit of the pond is acceptable.	3	3 •Potential park/beautification area. •There would be impacts during construction.	3.50	•Installing additional stormwater infrastructure will allow for additional tributary area. •Water quality benefits would be low since there are no major arterials flowing to the area. •There would be impacts to the park during construction.	Medium	no futher action
T	Along 126th Ave NE (which transitions into NE 112th Pl) between NE 110th Pl to the South and 124th Ave NE to the West.	Intercept stormwater from 110th and narrow the road to incorporate GSI; might be difficult as we turn the corner on 112th but could be a traffic calming approach on 126th.	Yes		•City of Kirkland ROW	5	3 •Additional stormwater infrastructure would be needed to increase tributary area.	5 •No obvious permitting challenges.	3	3 •Deep infiltration potential at the southern portion of the site and low shallow or deep infiltration at the northern portion of the site.	2 •Installation of a facility/GIS possible since there is deep infiltration potential.	2 •Neighborhood roads can be treated for water quality, but no major arterials.	4 •GSI instead of empty space/pavement. •Traffic calming.	3.38	•Since there is high infiltration potential in this area GSI can be used within the area and provide flow control and water quality benefits. •Pavement removal may be possible. •Traffic calming is also possible.	Medium	top 6
U	North Rose Hill Sub-Basin	BASIN-WIDE IMPLEMENTATION WHERE FEASIBLE; GSI along streets within North Rose Hill Sub-Basin City of Kirkland ROW	Yes	20%-30% of basin area located within ROW	•City of Kirkland ROW	5	5	5	4	4 •Deep infiltration potential.	3	3	4 •GSI instead of empty space/pavement.	4.13	•Since areas will only be evaluated where there is infiltration potential, GSI can be used to provide flow control and water quality benefits.	High	explore basin-wide
V	North Rose Hill Sub-Basin	BASIN-WIDE IMPLEMENTATION; Flow Control In Upstream Part of Basin WHERE FEASIBLE	Yes	North Rose Hill Sub-Basin	•N/A	3 •Owner of property will need to be determined	3	3	4	4 •Deep infiltration potential.	3	3	3	3.25	•Add flow control structures with water quality within the upstream portion of the basin.	Medium	no futher action
W	North Rose Hill Sub-Basin	BASIN-WIDE IMPLEMENTATION OF Water Quality In Upstream Part of Basin (WQ vaults and UIC wells) WHERE FEASIBLE	Yes	Upstream Portion of North Rose Hill Sub-Basin (where infiltration is feasible)	•N/A	3 •Owner of property will need to be determined	3	3	4	4 •Deep infiltration potential.	3	3	3	3.25	•Add water quality units with IUC wells at existing facilities located within the upstream portion of the basin.	Medium	explore basin-wide

Forbes Creek/North Rose Hill Basin Retrofit Project
Site Selection - Work In Progress

NORTH ROSE HILL BASIN POTENTIAL SITES - List of 6

Potential Site ID	Location	Description	Aerial Photo	Ownership	CH2M Characterization of Feasibility and Benefits (1-5)								Overall Site Rating	Feasibility Assessment	CH2M initial assessment: Low (worst), Medium (let's discuss), High (best!)	Path Forward (after 8/8/18 workshop)
					Feasibility			Benefits								
					Willingness of owner to site project at location	Engineering Feasibility	Permitting Feasibility	Amount of Tributary Area	Infiltration Capacity	Potential for flow control benefit?	Potential for water quality benefit?	Magnitude of potential community (co-benefits)				
A (Site 1)	Southeast of the 124th Ave NE and NE 108th Pl Intersection, located within the boundaries of 124th Ave NE to the East, 126th Ave NE to the West, NE 108th Pl to the North, and 107th Pl to the South.	•This potential site is a combination of four areas including the existing pond area, existing utility easement area, along NE 107th Place, and along 106th Ave NE. •The four individual sites within the combination can also be found listed below.		•Private Property •City of Kirkland •City of Kirkland ROW	2 •Residential properties would need to agree to sell their property or provide an easement. •Need to confirm ROW property is available. •Pond retrofit discussion is required with the City of Kirkland.	4	5 •No obvious permitting challenges •Confirmation the existing City of Kirkland pond is not located within a wetland.	4 •A large amount of tributary area is available from the east and north.	4 •Deep infiltration potential.	4	4 •Need to confirm retrofit of the existing pond is possible. •There are no major arterials located within the tributary area.	4 •GSI instead of existing pavement or empty space. •Traffic calming and the beautification of existing pond.	3.86	•This potential site area includes a combination of four areas that would allow for a large amount of flow control and water quality benefit. •Since there is high infiltration potential in this area GSI can also be used within the area. •Obtaining property or an easement from the residential properties may be difficult.	High	top 6
B	Southwest of the NE 108th Pl and 124th Ave NE intersection.	•This potential site is located on the Boys and Girls Club private property.		•Private Property	2 •Boys and Girls club would need to agree to sell a portion of their property or provide an easement.	2 •Additional stormwater infrastructure would be needed.	5 •No obvious permitting challenges.	3 •Additional tributary area can be added to the potential site if additional stormwater infrastructure is installed.	2 •Low shallow or deep infiltration potential.	4 •Medium-High flow control benefit available if additional tributary area is added to the potential site.	4 •Medium-High water quality benefit available since there is potential to collect area along 124th Ave NE and Slater Ave NE.	3 •There will be impacts to the site during construction, but the field will be restored to a condition than existing.	3.13	•Potential detention facility location can be constructed within the private property open field area. •Installing a facility would add additional flow control and water quality benefits. •Additional tributary area can be added to the site if stormwater infrastructure is installed. •There is low infiltration potential at the site.	Medium	top 6
E (Site 2)	Intersection of NE 111th Pl and 127th Pl NE	•The potential site is located within the intersection of NE 111th Pl and 127 Pl NE, which is downstream of an existing detention tank system.		•City of Kirkland ROW	5 •Confirmation is needed to determine if these pipes are located within an easement or ownership.	3	5 •No obvious permitting challenges.	3 •There is approximately 12 acres of tributary area including the area upstream currently being collected by the detention pipe system. •This area does not include high-use streets.	4 •Deep infiltration potential.	2 •There is an existing detention vault system located upstream of these pipes.	3 •There is an existing detention vault system located upstream of these pipes. •Water quality can be improved by adding a water quality structure and UIC well.	1 •No potential community co-benefits.	3.25	•Installing a facility or installing GIS may have little impact to this area since there is a detention vault located upstream of this site area.	Medium	top 6
M (Site 3)	East of the NE 115th Pl and 124th Ave NE intersection.	This potential site is located within an open site/park owned by the City of Kirkland.		•City of Kirkland	4	4 •Within a medium landslide zone or buffer.	5 •No obvious permitting challenges.	4 •Tributary area includes sub-basin area to the east.	2 •Low shallow or deep infiltration potential.	3 •Medium flow control benefit available due to the collection of the sub-basin area.	3 •Neighborhood roads can be treated for water quality, but no major arterials.	3 •There will be impacts to the site during construction, but the open area will be restored to a condition than existing.	3.50	•Within a landslide zone or buffer. •Low infiltration potential within open space/park owned by the City of Kirkland. •Sub-basin area is currently flowing towards this area to detention pipes downstream of the park. • This site could provide medium-high flow control and water quality benefits.	Medium	top 6
N (Site 4)	Northwest of the NE 113th St and 128th Ave NE intersection.	This potential site is located along NE 111th between 127th Pl NE to the west and 128th Ave NE to the east. The area also includes a small portion of 127th Pl NE and128th Ave NE.		•City of Kirkland ROW	5	4 •Within a medium landslide zone or buffer.	5 •No obvious permitting challenges.	3 •Medium amount of tributary area from the southeastern sub-basin area.	4 •Deep infiltration potential.	3	3 •Bioretention/ GSI can improve water quality.	4 •GSI within ROW area.	3.88	•Within a landslide zone or buffer. •Since there is high infiltration potential in this area GSI can be used within the area and provide flow control and water quality benefits. •Pavement removal may be possible.	High	top 6
T (Site 5)	Along 126th Ave NE (which transitions into NE 112th Pl) between NE 110th Pl to the South and 124th Ave NE to the West.	Intercept stormwater from 110th and narrow the road to incorporate GSI; might be difficult as we turn the corner on 112th but could be a traffic calming approach on 126th.		•City of Kirkland ROW	5	3 •Additional stormwater infrastructure would be needed to increase tributary area.	5 •No obvious permitting challenges.	3	3 •Deep infiltration potential at the southern portion of the site and low shallow or deep infiltration at the northern portion of the site.	4 •Installation of a facility/GIS possible since there is deep infiltration potential.	4 •Neighborhood roads can be treated for water quality, but no major arterials.	4 •GSI instead of empty space/pavement. •Traffic calming.	3.88	•Since there is high infiltration potential in this area GSI can be used within the area and provide flow control and water quality benefits. •Pavement removal may be possible. •Traffic calming is also possible.	High	top 6

last revision: 1/10/2019

Attachment C
Basin-Wide Analyses

Basin-Wide Analyses

Forbes Creek/North Rose Hill Basin Stormwater Retrofit

CH2M performed a desktop analysis to identify where in the North Rose Hill Basin that the City of Kirkland could implement Best Management Practices (BMPs) within the Right-of-Way. The City could then either opportunistically implement these BMPs as other infrastructure improvements are made in the basin, or else implement these BMPs one by one until target water quality or water quantity objectives are met for the basin. The three BMPs chosen for these analyses were bioretention, water quality treatment at a small scale (such as catch basin or proprietary treatment device such as Filterra) and water quality treatment at a larger scale such as a vault or larger proprietary treatment device.

GIS was utilized to assess feasibility of each of the three BMPs based upon the feasibility criteria listed in the table below. Figure A shows where bioretention might be feasible. Figure B shows where smaller-scale water quality treatment devices might be feasible. Figure C shows where vaults or larger proprietary treatment devices might be feasible.

Best Management Practice	**Criteria for Feasibility**
Bioretention	**Right of Way width** (39' ROW to accommodate 24' roadway for 2 driving lanes and 1 parking lane and 15' for bioretention and sidewalk) **Slope** (<5%)
Water Quality Treatment (Catch Basin or Filterra)	**Infiltration** (assumed east of infiltration line – from preliminary infiltration assessment; set as a criteria because of the interest in pairing such treatment with a UIC well) **Right of Way width** (at least 4' wide existing planter strip)
Water Quality Treatment (Vault or larger Proprietary Treatment)	**Infiltration** (assumed east of infiltration line – from preliminary infiltration assessment; set as a criteria because of the interest in pairing such treatment with a UIC well) **Conveyance Infrastructure** (Maintenance holes or catch basins must have a difference of 8 feet between the rim elevation and the depth to the outlet invert elevation.)

Figure A. Feasibility of Bioretention in the North Rose Hill Basin of Forbes Creek

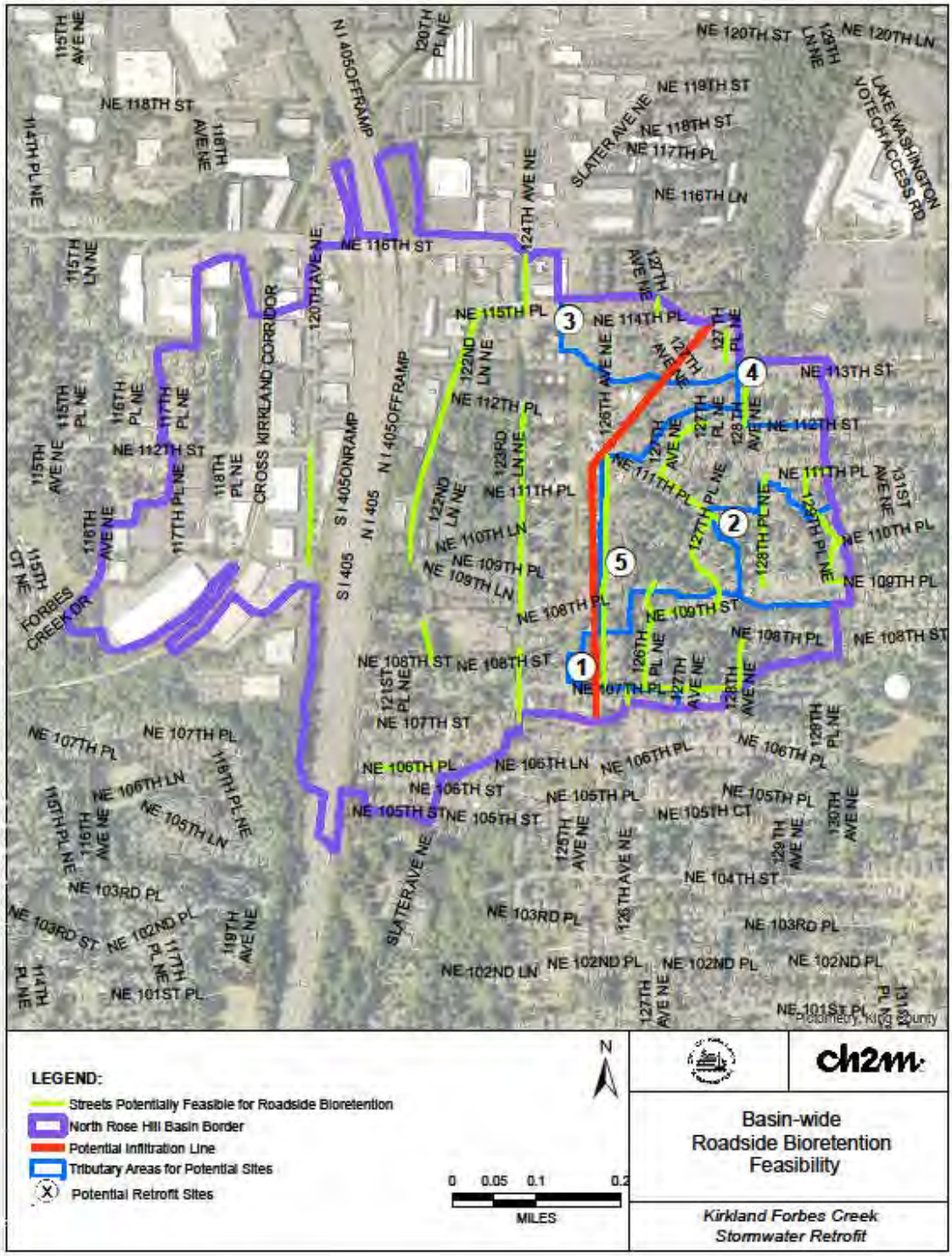


Figure B. Feasibility of Small-scale (catch basin, small scale proprietary treatment) water quality treatment in the North Rose Hill Basin of Forbes Creek

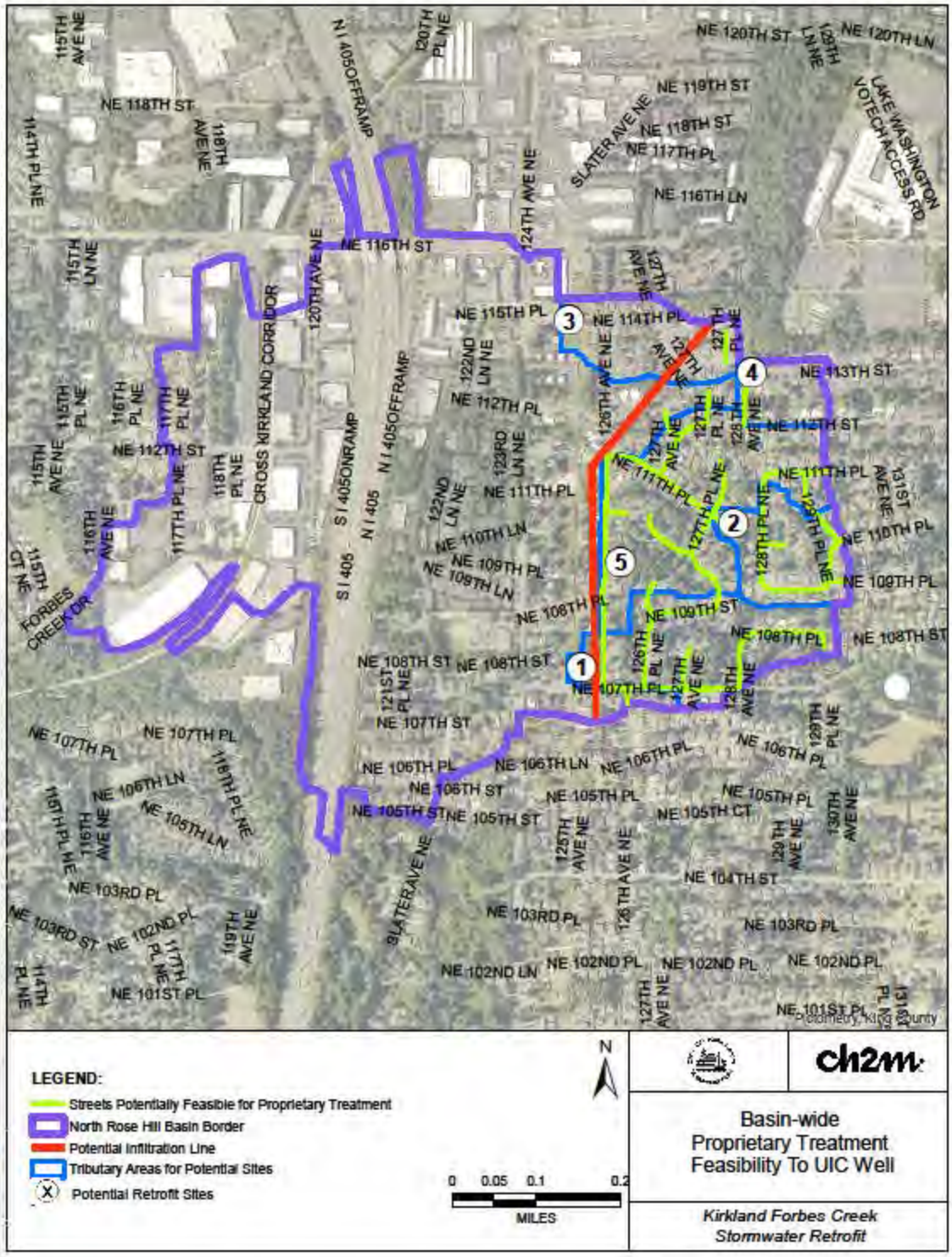
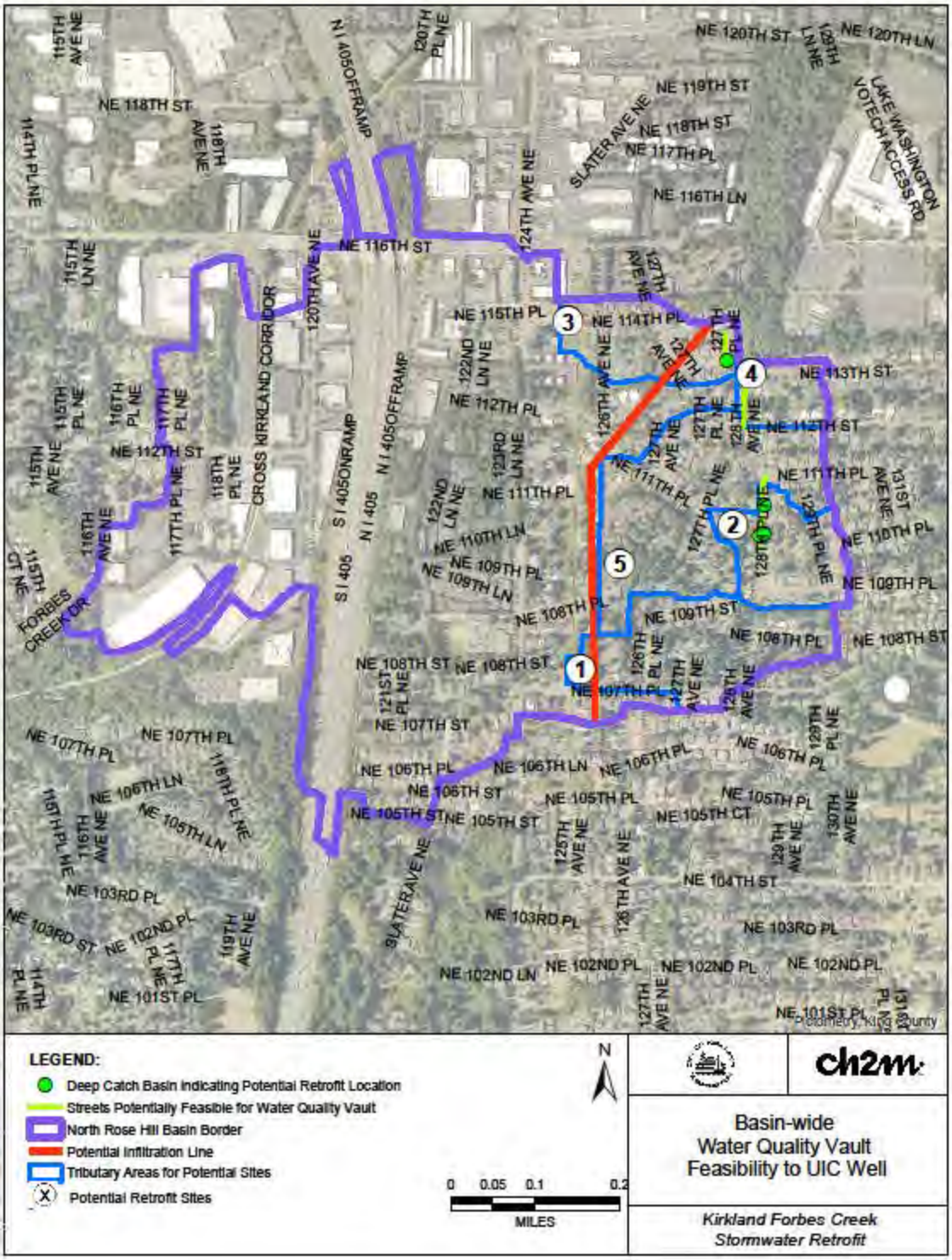


Figure C. Feasibility of larger scale (vault, larger proprietary treatment device) water quality treatment in the North Rose Hill Basin of Forbes Creek



Attachment D
Field Evaluation

Field Evaluation

Forbes Creek/North Rose Hill Basin Stormwater Retrofit

Site: **Site 1 (Previously known as Site A); Retention Pond Retrofit @ NE 107th Place**

Date and Time: 8/16/18 9am

In attendance: Amy Carlson (CH2M), Jesse Williams (CH2M)

Weather Conditions: overcast, warm

Observations:

- Existing retention pond – grass cut, drainage infrastructure recently located (green paint)
- 107th sees a lot of traffic – limited site distance due to hill
- House to the west of existing pond is up for sale
- Significant amount of blackberries line the existing pond to the east
- Site doesn't appear used by the public as open space
- Overhead power lines (Seattle City Light)

Photographs:

Field Evaluation

Forbes Creek/North Rose Hill Basin Stormwater Retrofit

Site: **Site 2 (Previously known as Site E); Water Quality Treatment and Infiltration @ NE 11th Place/127th Place NE**

Date and Time: 8/16/18 930am (with photographs from 10/1/18 at 7:15am, because photographs taken on 8/16/18 did not show all of the potential site)

In attendance: Amy Carlson (CH2M), Jesse Williams (CH2M)

Weather Conditions: overcast, warm

Observations:

- Street used for parking – though most residents appear to park in their driveways
- Very limited traffic observed on these particular days – just residents
- Walked through maintained easement path towards existing stormwater retention facility
- Pavement condition is good
- Sidewalks on both sides of the street

Photographs:

Field Evaluation

Forbes Creek/North Rose Hill Basin Stormwater Retrofit

Site: **Site 3 (Previously known as Site M); Retention Facility @ NE 114th Place / 126th Ave NE**

Date and Time: 8/16/18 10am

In attendance: Amy Carlson (CH2M), Jesse Williams (CH2M)

Weather Conditions: overcast, warm

Observations:

- Steep easement down the hill from 114th
- Grass on easement is cut, not clear if resident does this or City?
- City owned property appears to not be used as cut through in current state (blackberries)
- Traffic moving at higher than posted speeds on 114th Place around the bend
- City Light powerline easement

Photographs:

Field Evaluation

Forbes Creek/North Rose Hill Basin Stormwater Retrofit

Site: **Site 4 (Previously known as Site N); Water Quality Treatment @ NE 113th Place / 128th Ave NE**

Date and Time: 8/16/18 1030am (with photographs from 10/1/18 at 7:30am, because photographs taken on 8/16/18 did not show all of the potential site)

In attendance: Amy Carlson (CH2M), Jesse Williams (CH2M)

Weather Conditions: overcast, warm

Observations:

- On a limited basis - Street used for parking
- Seems like a good amount of traffic; high usage area (observed each time visited)
- Pavement condition is good
- Sidewalks on west part of site; pavement in good condition

Photographs:

STOP

Field Evaluation

Forbes Creek/North Rose Hill Basin Stormwater Retrofit

Site: **Site 5 (Previously known as Site T); Bioretention and Infiltration @ 126th Ave NE**

Date and Time: 8/16/18 1130am

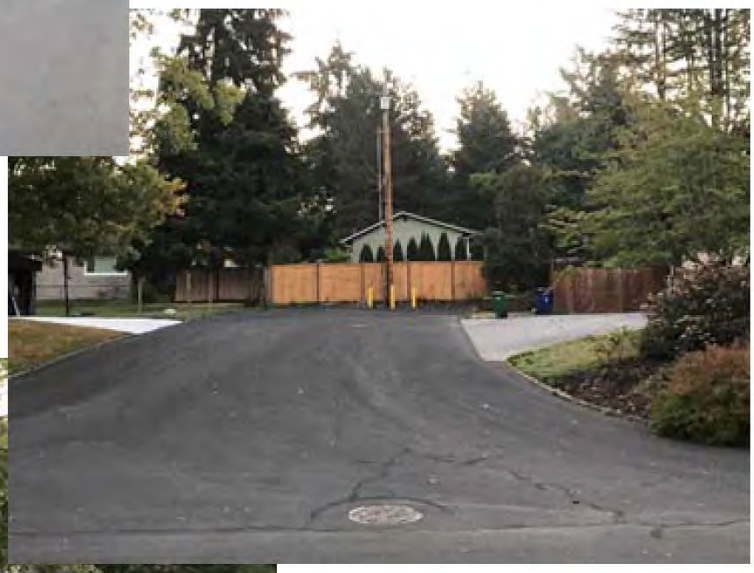
In attendance: Amy Carlson (CH2M), Jesse Williams (CH2M)

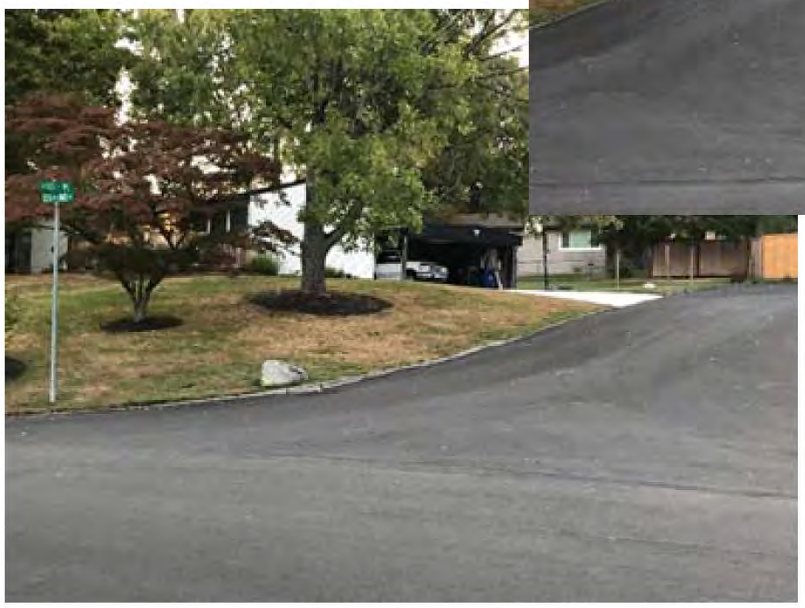
Weather Conditions: overcast, warm

Observations:

- Street parking utilized – both sides of the street
- Very little traffic – perhaps just residents? Doesn't appear to be used as a cut through
- Very wide pavement width – parking both sides plus two generously-sized travel lanes
- Lots of mature vegetation – rhodedendrons and large trees
- No sidewalks

Photographs:





Attachment E
Fact Sheets

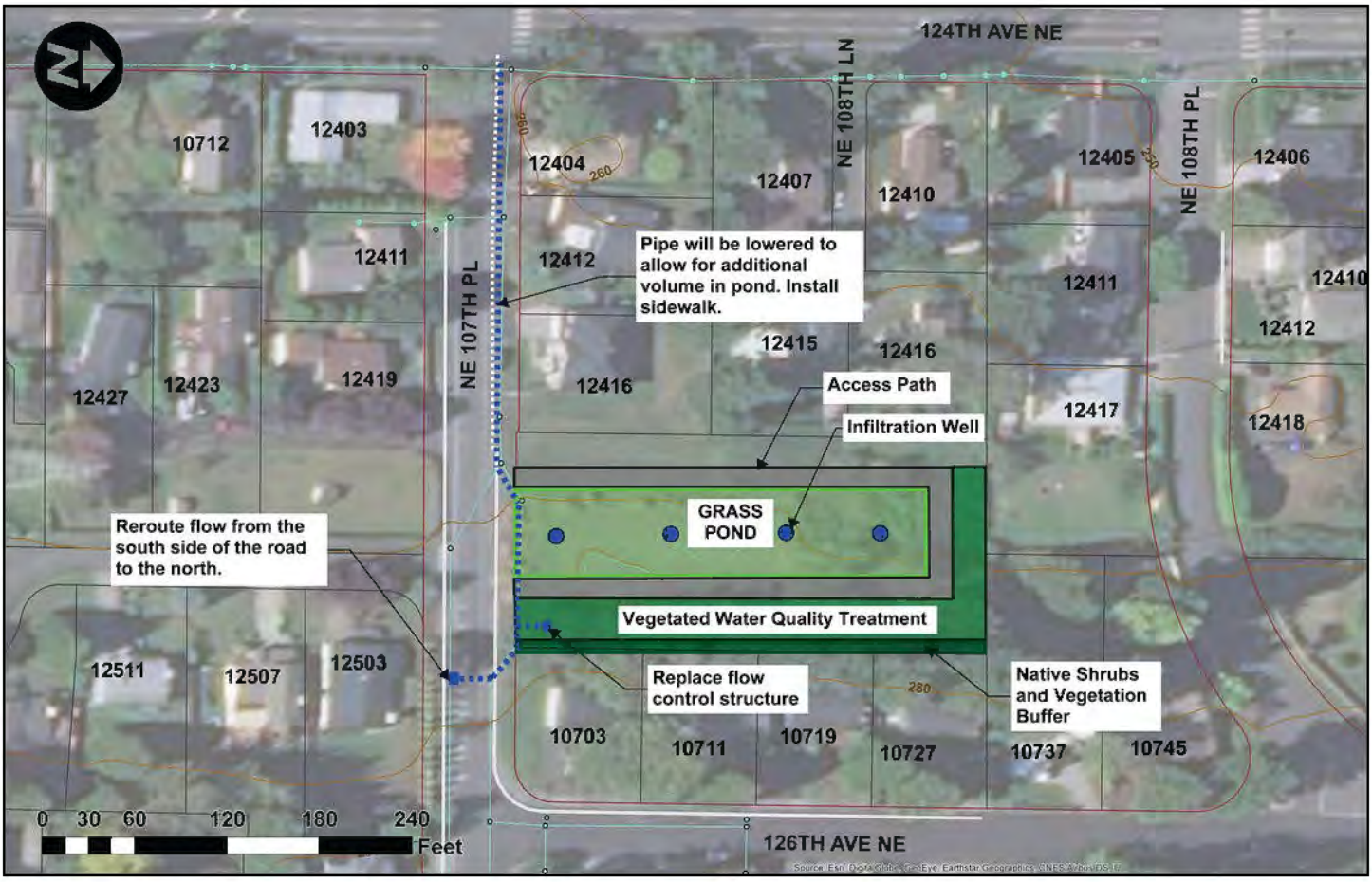
Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 1: Retention Pond Retrofit @ NE 107th Place

Description

This project consists of reconfiguring and enlarging the existing stormwater retention pond and installing infiltration wells. Project goals are to improve water quality and decrease the chance of flooding downstream. The tributary area for this project is approximately 18 acres.

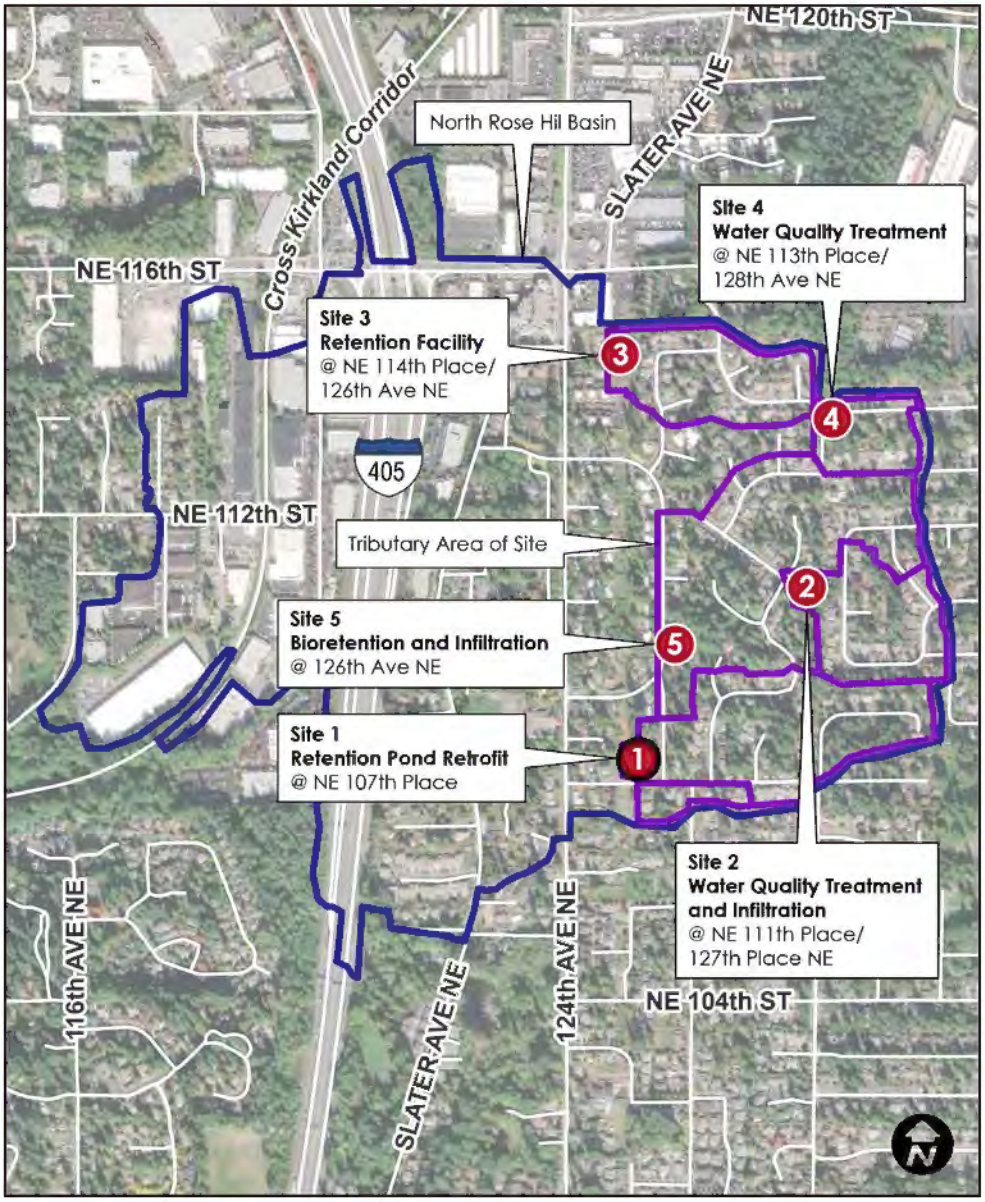


Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 1: Retention Pond Retrofit @ NE 107th Place

North Rose Hill Basin Potential Site Locations



Design Elements

Stormwater Management Techniques

- Storage (retention pond retrofit)
- Infiltration

Potential Environmental Benefits

- Improved water quality in Forbes Creek
- Reduced chance of flooding

Potential Impacts

- Re-configuration of drainage pipes entering and exiting the pond will require disturbance of curbline and sidewalk during construction.
- Improvements to sidewalk and curbline planned for just west of pond site on NE 107th Place.
- Access is needed for periodic maintenance.

Community Input Needed

Potential Community Benefits

- How could we enhance this space? (For example, benches, open space, trail, public art.)

Ask Us About

- Keeping pollutants out of the groundwater
- Minimizing impacts during construction

What's Next?

With your input, the City of Kirkland will select the top three locations from the five potential project locations. Once the top three projects are selected, we need your help to further refine each project.

For more information, and to provide input in future phases, contact **Jenny Gaus** at **425-587-3850** or at **jgaus@kirklandwa.gov**, or visit **www.kirklandwa.gov/ForbesCreek**.

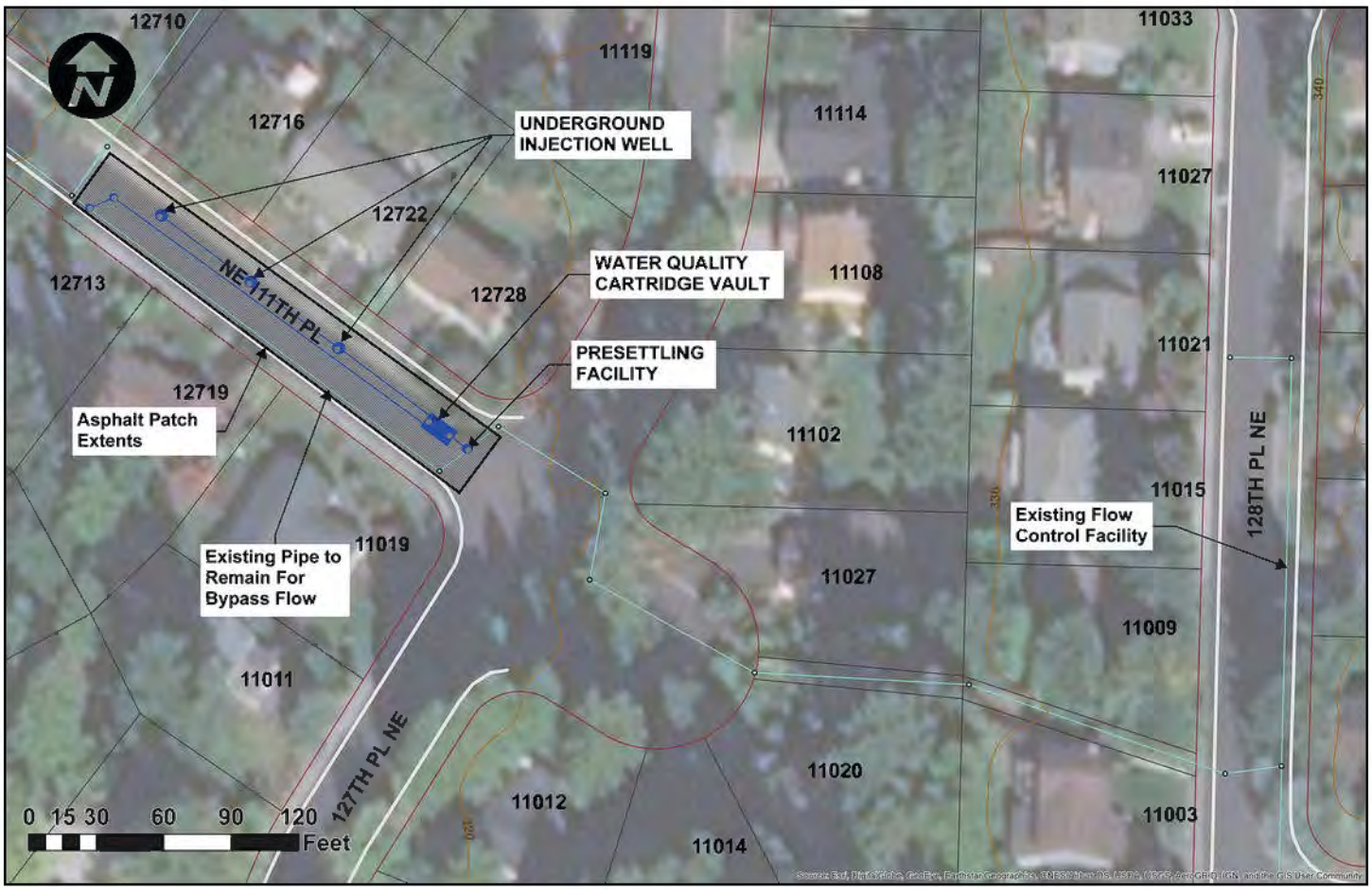
Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 2: Water Quality Treatment and Infiltration @ NE 111th Pl/127th Pl NE

Description

This project consists of installing water quality treatment devices and infiltration wells in the street right-of-way on NE 111th Place just west of 127th Place NE. Project goals are to improve water quality and decrease flooding downstream. The tributary area for this project is approximately 10 acres.

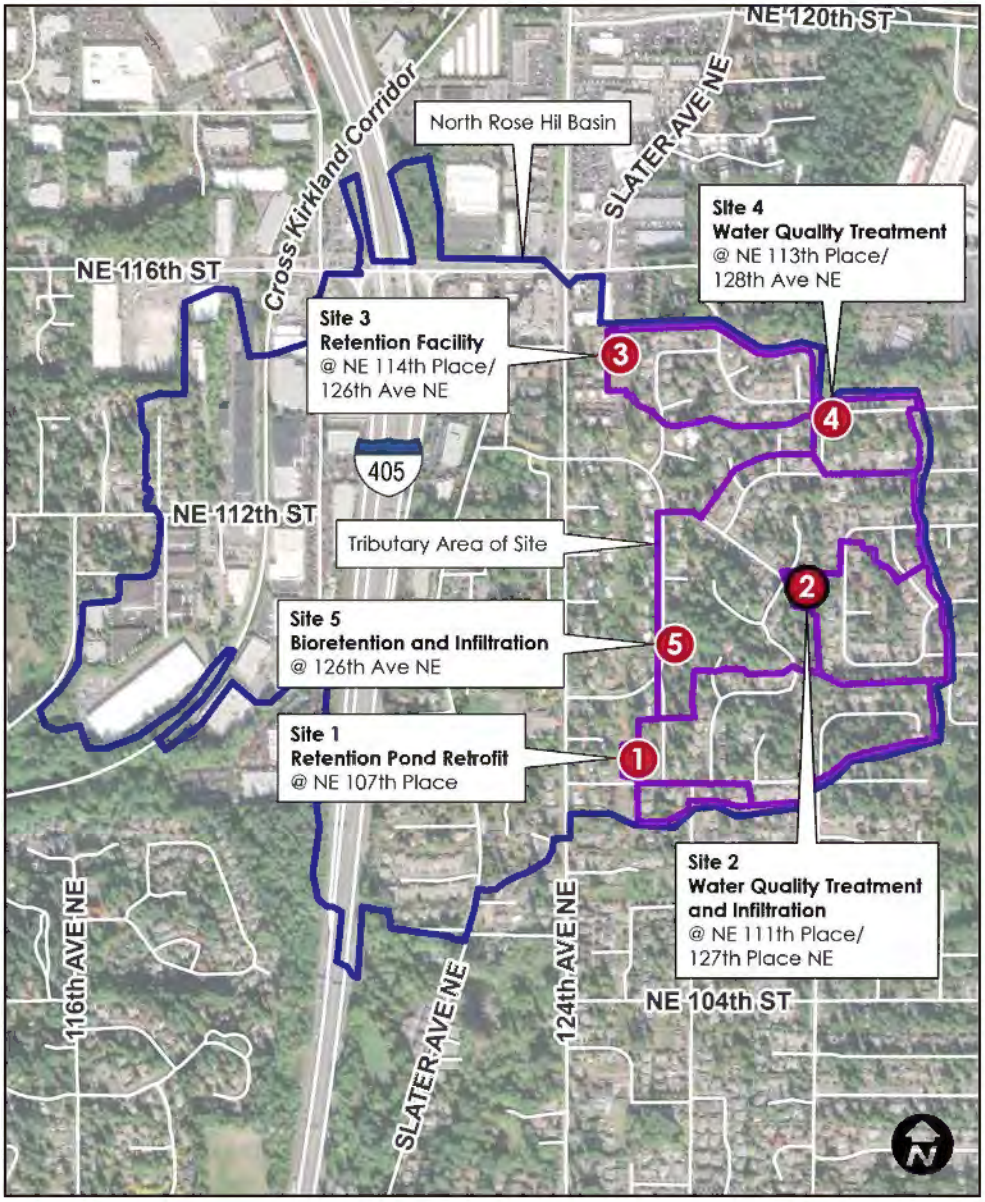


Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 2: Water Quality Treatment and Infiltration @ NE 111th Pl/127th Pl NE

North Rose Hill Basin Potential Site Locations



Design Elements

Stormwater Management Techniques

- Water quality treatment (either proprietary treatment devices or vault)
- Infiltration

Potential Environmental Benefits

- Improved water quality in creek
- Reduced chance of flooding

Potential Impacts

- No change to above-ground infrastructure planned.
- No work planned outside of the public right-of-way.
- New elements would work with existing retention facility located in 128th Place NE.
- During construction, will require roadway closure.
- After completion, partial lane closure for annual maintenance (up to 1 working day).

Community Input Needed

Potential Community Benefits

- How could we enhance this space? (For example, interpretive signage, or public art.)

Ask Us About

- Keeping pollutants out of the groundwater
- Maintenance access and schedule
- Minimizing impacts during construction

What's Next?

With your input, the City of Kirkland will select the top three locations from the five potential project locations. Once the top three projects are selected, we need your help to further refine each project.

For more information, and to provide input in future phases, contact **Jenny Gaus** at **425-587-3850** or at **jgaus@kirklandwa.gov**, or visit **www.kirklandwa.gov/ForbesCreek**.

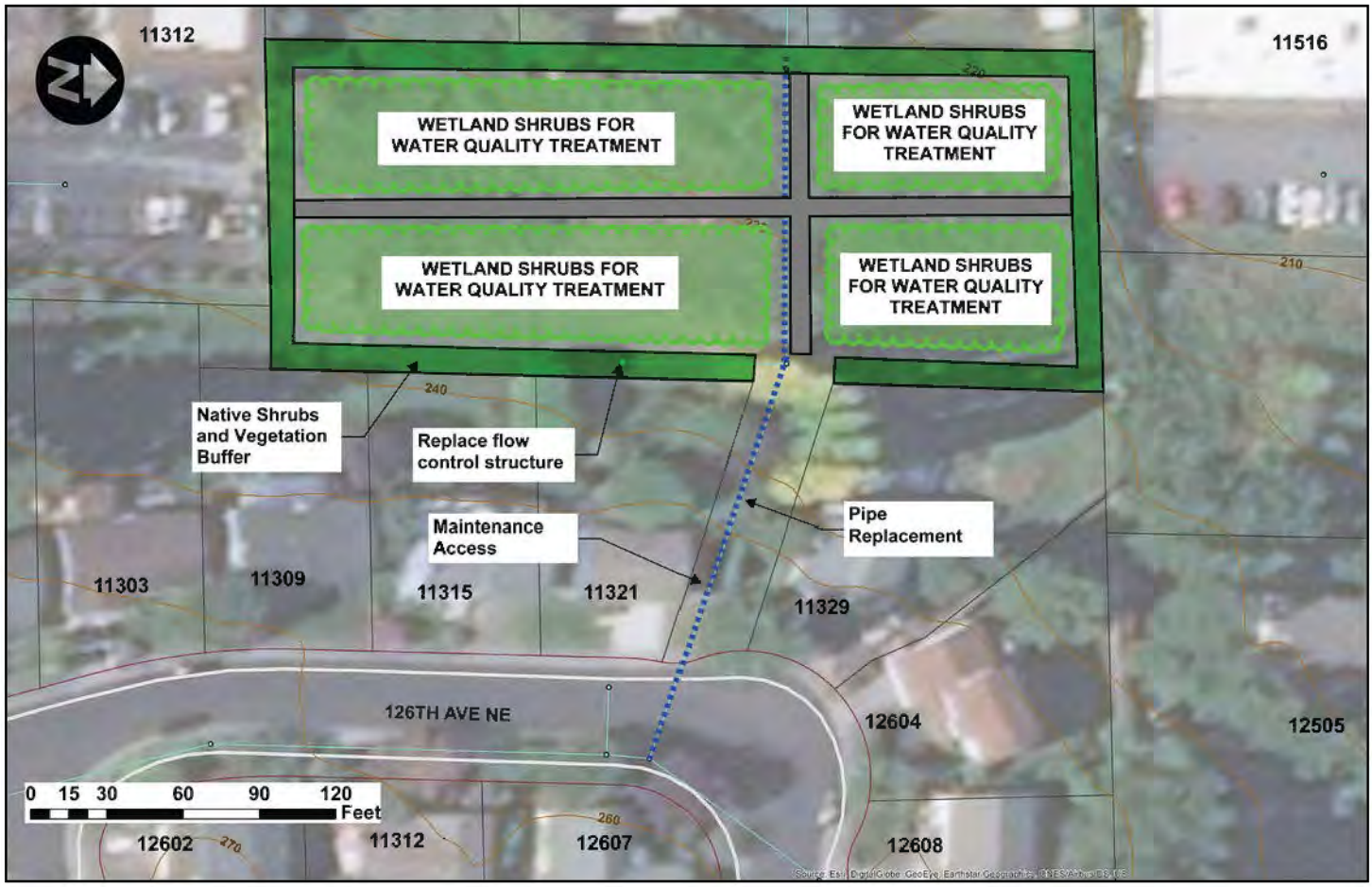
Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 3: Retention Facility @ NE 114th Place/126th Ave NE

Description

This project consists of building a stormwater retention facility (either below ground or above ground), replacing an aging stormwater pipe, and planting aesthetically pleasing vegetation. Project goals are to improve water quality and decrease flooding downstream. The tributary area for this project is approximately 11 acres.

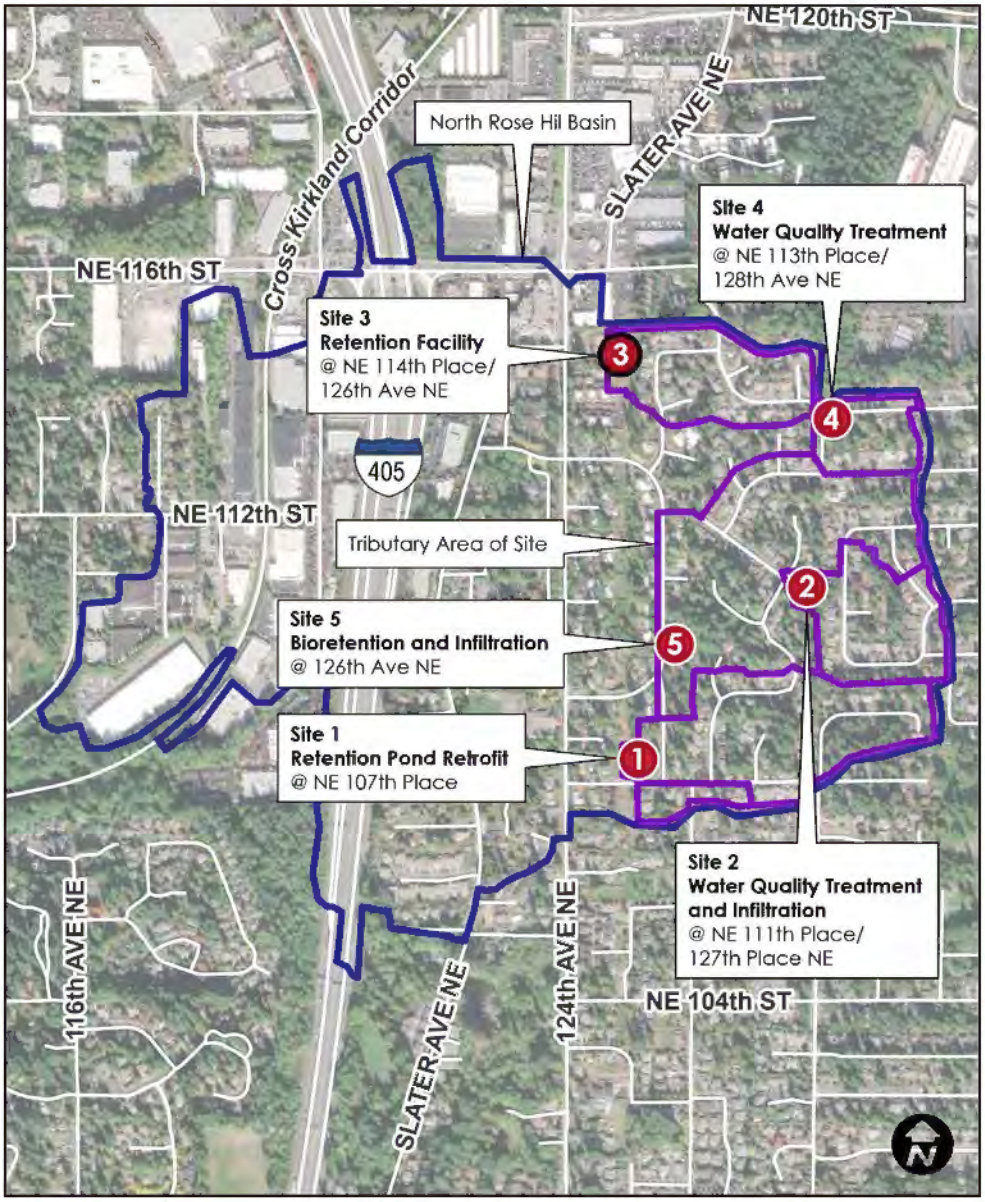


Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 3: Retention Facility @ NE 114th Place/126th Ave NE

North Rose Hill Basin Potential Site Locations



Design Elements

Stormwater Management Techniques

- Storage (either above ground retention pond or vault)
- Water quality treatment (either proprietary treatment devices or vault)

Potential Environmental Benefits

- Improved water quality in Forbes Creek
- Reduced chance of flooding

Potential Impacts

- Need to consider access (both for public use of location and for maintenance)
- During construction, will require staging area proximate to site

Community Input Needed

Potential Community Benefits

- How would you like to use this space?
- How could we enhance it? (For example, trails, benches, interpretive signage, or public art.)
- How would you want to access this space?

Ask Us About

- Maintenance impacts and schedule
- Minimizing impacts during construction

What's Next?

With your input, the City of Kirkland will select the top three locations from the five potential project locations. Once the top three projects are selected, we need your help to further refine each project.

For more information, and to provide input in future phases, contact **Jenny Gaus** at **425-587-3850** or at **jgaus@kirklandwa.gov**, or visit **www.kirklandwa.gov/ForbesCreek**.

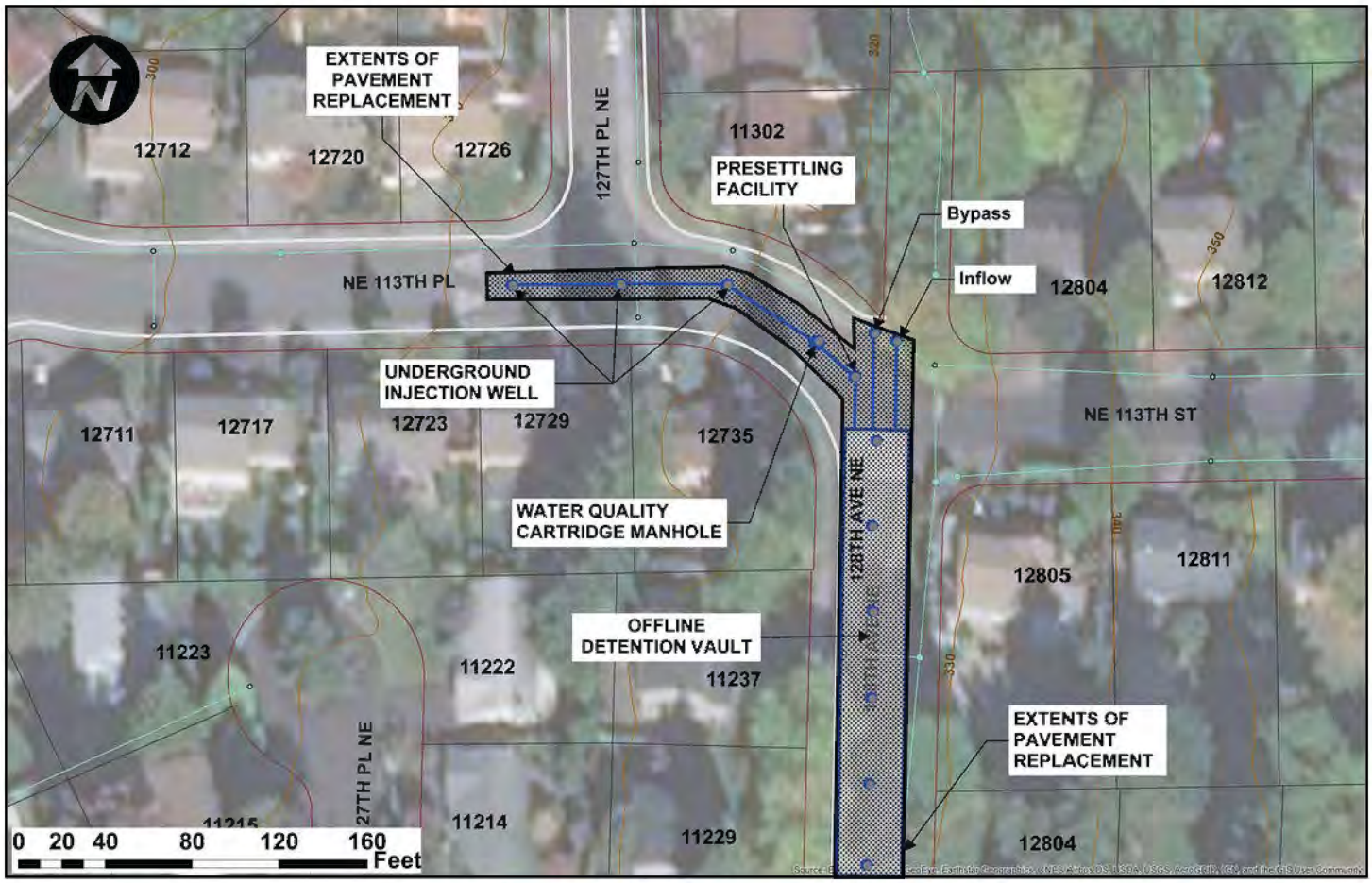
Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 4: Water Quality Treatment @ NE 113th Place/128th Ave NE

Description

This project consists of installing water quality treatment devices in the street right-of-way at the intersection of NE 113th Place and 128th Avenue NE. The project goal is to improve water quality. The tributary area for this project is approximately 5 acres.

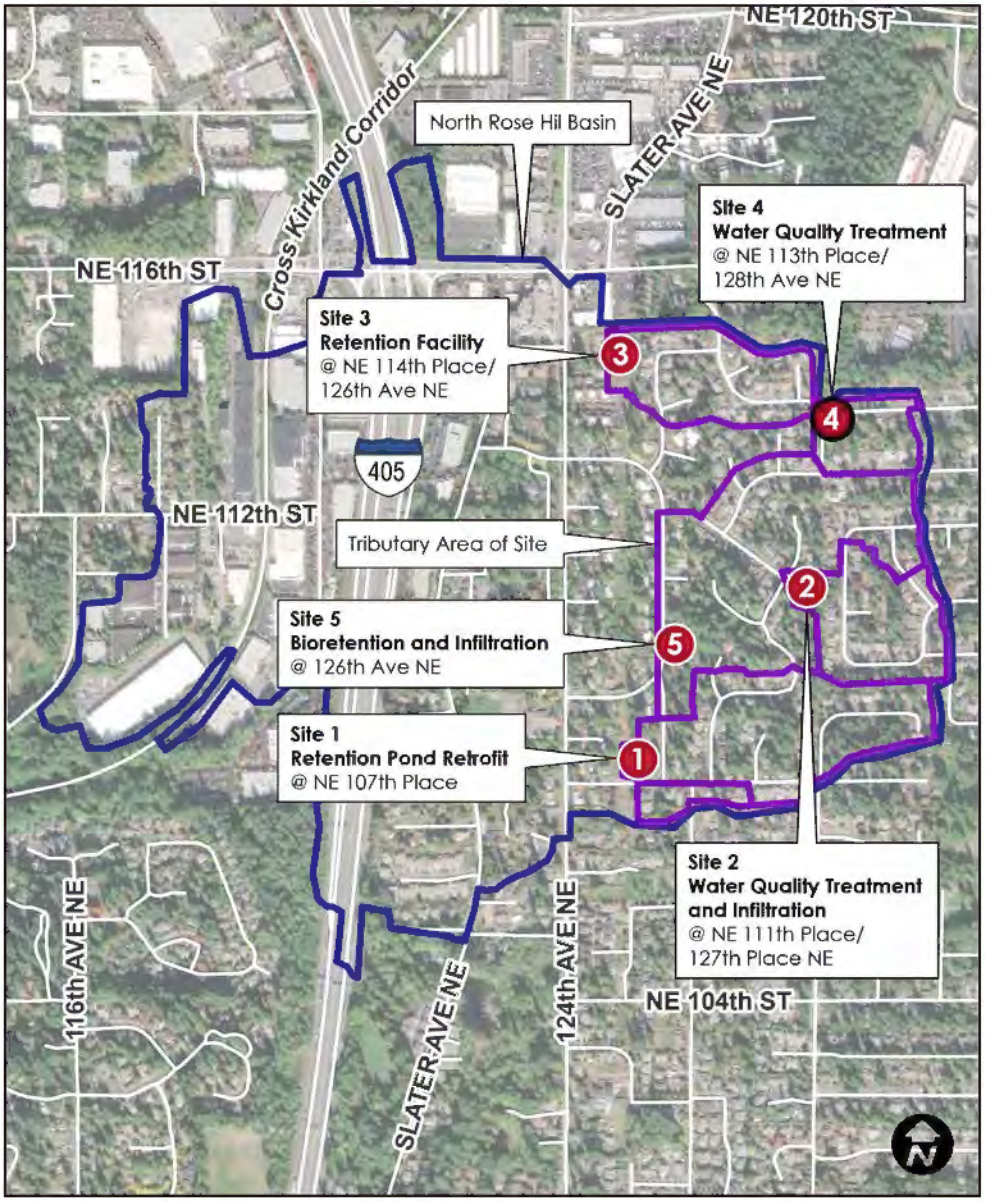


Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 4: Water Quality Treatment @ NE 113th Place/128th Ave NE

North Rose Hill Basin Potential Site Locations



Design Elements

Stormwater Management Techniques

- Water quality treatment (either proprietary treatment devices or vault)

Potential Environmental Benefits

- Improved water quality in Forbes Creek

Potential Impacts

- No change to above-ground infrastructure planned as part of this project.
- No work planned outside of the public right-of-way.
- During construction, will require roadway closure.
- After completion, partial lane closure needed during annual maintenance (up to 1 working day).

Community Input Needed

Potential Community Benefits

- How could we enhance this space? (For example, interpretive signage, or public art.)

Ask Us About

- Maintenance impacts and schedule
- Minimizing impacts during construction

What's Next?

With your input, the City of Kirkland will select the top three locations from the five potential project locations. Once the top three projects are selected, we need your help to further refine each project.

For more information, and to provide input in future phases, contact **Jenny Gaus** at **425-587-3850** or at **jgaus@kirklandwa.gov**, or visit **www.kirklandwa.gov/ForbesCreek**.

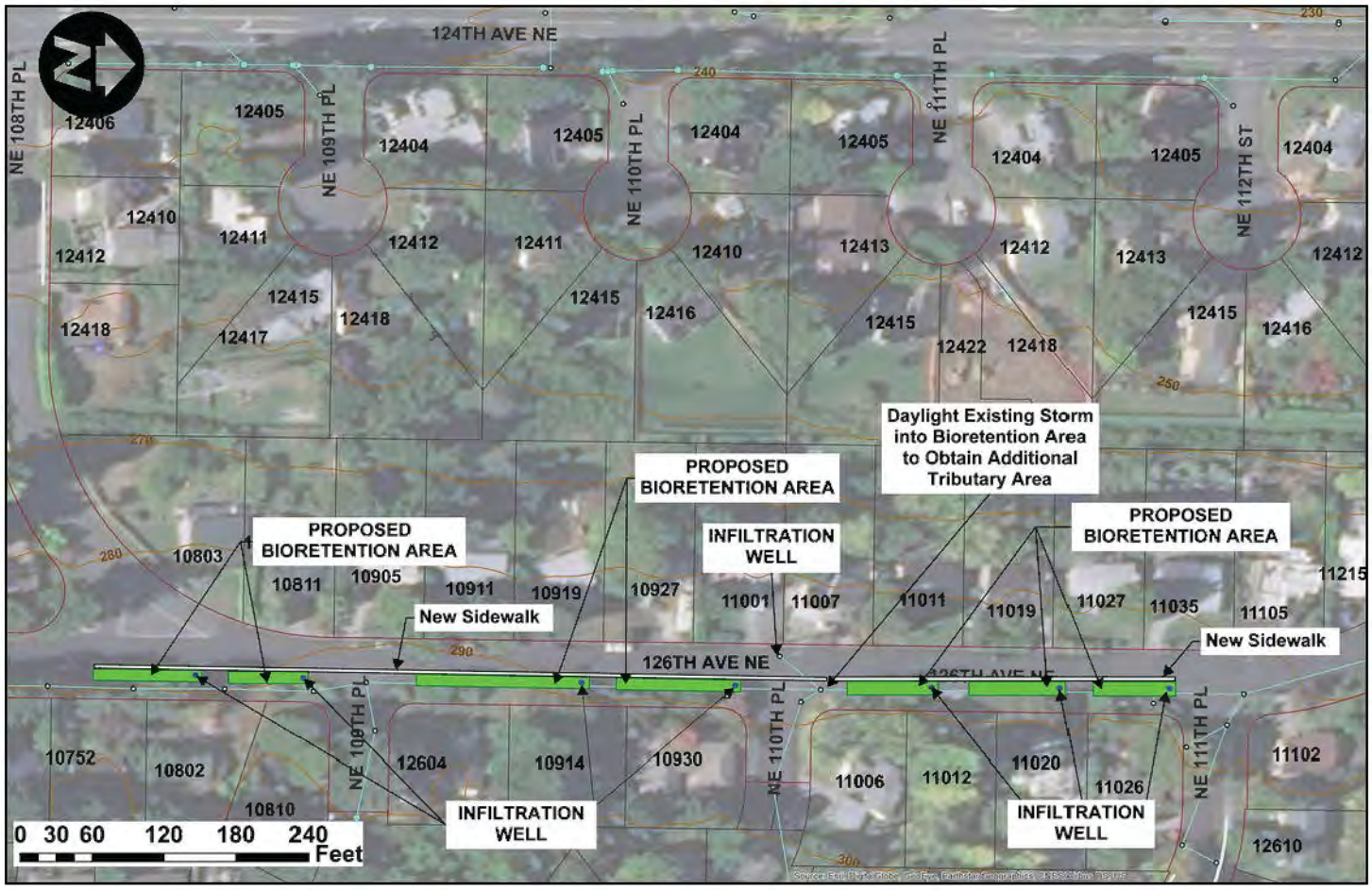
Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 5: Bioretention and Infiltration @ 126th Ave NE

Description

This project consists of installing bioretention swales and infiltration wells along 126th Ave NE. Project goals are to improve water quality benefit and decrease flooding downstream. The tributary area for this project is approximately 27 acres.

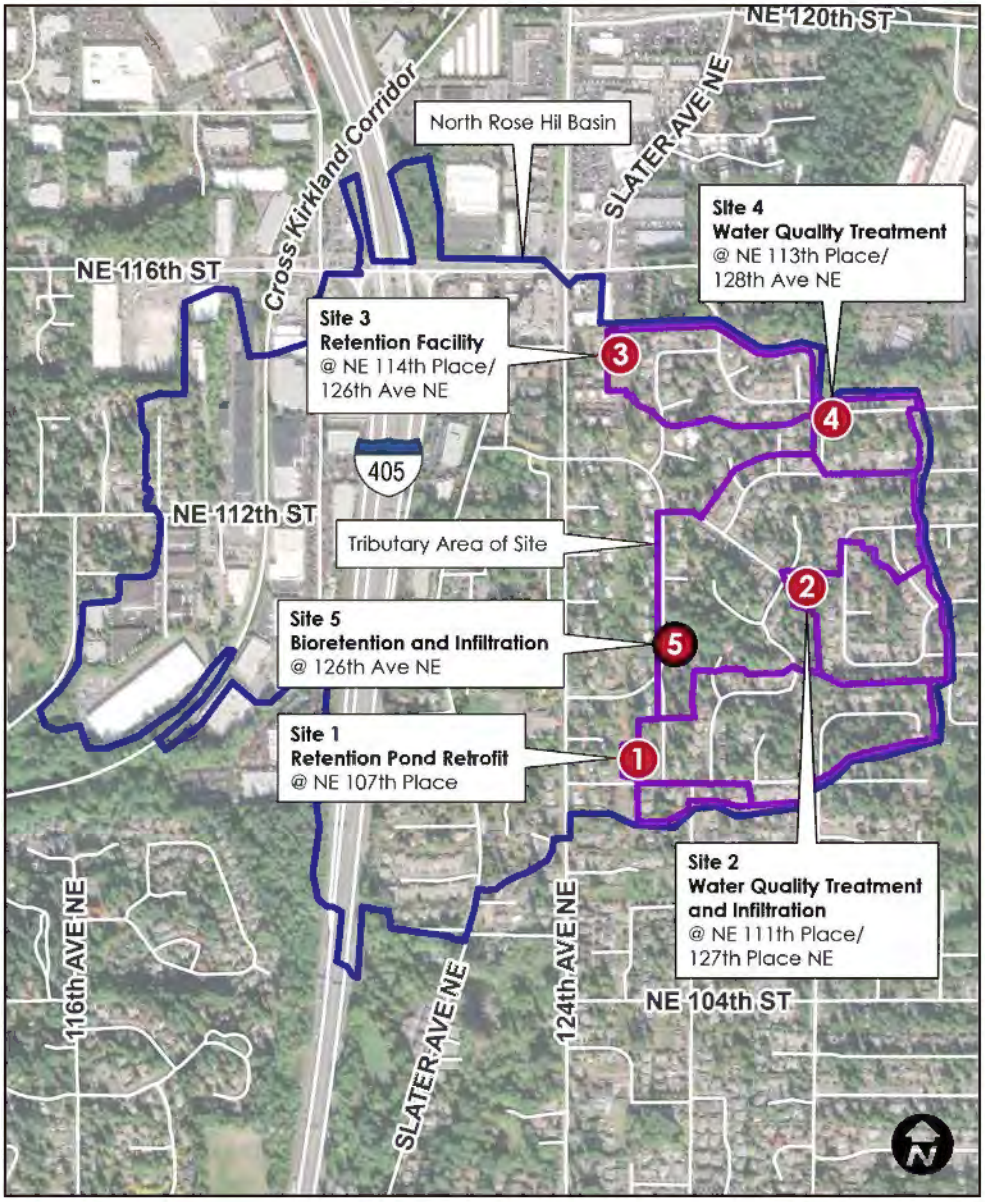


Forbes Creek
North Rose Hill Stormwater Project

Potential Project Location Fact Sheet

Site 5: Bioretention and Infiltration @ 126th Ave NE

North Rose Hill Basin Potential Site Locations



Design Elements

Stormwater Management Techniques

- Bioretention
- Infiltration

Potential Environmental Benefits

- Improved water quality in creek
- Reduced chance of flooding

Potential Impacts

- Using portion of street right-of-way for bioretention and new sidewalk will take away on-street parking on west side of 126th Ave NE
- Project elements include a new sidewalk along the west side of the roadway and preservation of existing driveways
- During construction, will require lane closure and on-street parking will be limited
- After completion, partial lane closure needed during periodic maintenance

Community Input Needed

Potential Community Benefits

- What elements of bioretention would be aesthetically pleasing to you?
- Would you want this in front of your house?
- Would you be willing to maintain the bioretention cells?

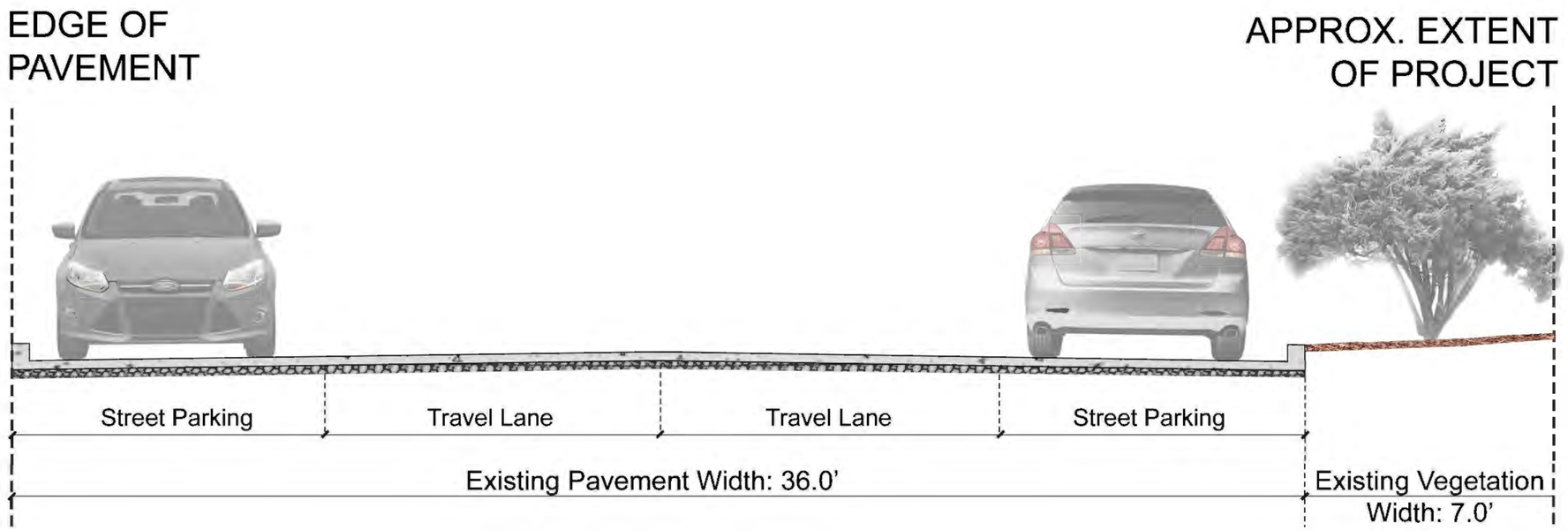
Ask Us About

- Keeping pollutants out of the groundwater
- Maintenance impacts and schedule
- Minimizing impacts during construction

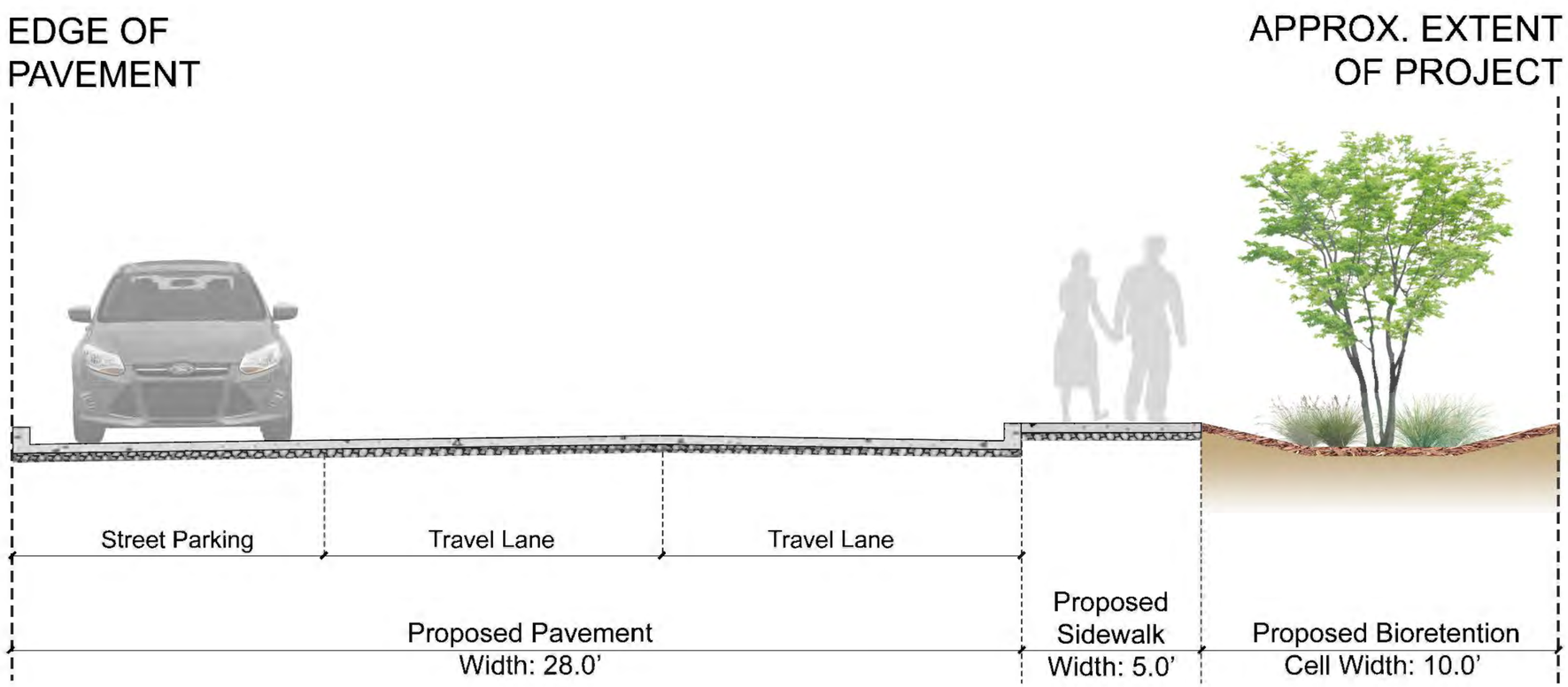
What's Next?

With your input, the City of Kirkland will select the top three locations from the five potential project locations. Once the top three projects are selected, we need your help to further refine each project.

For more information, and to provide input in future phases, contact **Jenny Gaus** at **425-587-3850** or at **jgaus@kirklandwa.gov**, or visit **www.kirklandwa.gov/ForbesCreek**.



EXISTING



PROPOSED CONCEPT

Attachment F
Public Engagement Materials and Feedback

TO: City of Kirkland
FROM: Cascadia Consulting Group
RE: City of Kirkland "Drainage in Your Neighborhood" Survey Analysis
DATE: August 16, 2018

Overview

The following memo summarizes the results of the 2018 "Drainage in Your Neighborhood" survey sent to North Rose Hill residents within the City of Kirkland ("the City"). This survey serves as the first step of a larger public involvement process designed to maintain engagement of key stakeholders and provide North Rose Hill residents with ample opportunity to be involved with informing the selection of drainage retrofit sites.

Cascadia collaborated with City staff to develop the community survey. Survey goals include:

- Gauging level of awareness and support for retrofit projects.
- Identifying existing drainage issues and additional interests.
- Determining stakeholder communication preferences.

Analysis

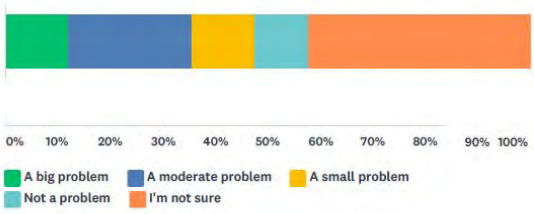
The City distributed the survey to North Rose Hill residents via direct mail. 23 survey recipients completed the survey online and 101 survey recipients completed the hardcopy survey and returned via mail to the City (124 total survey respondents). The City provided hardcopy responses to Cascadia and Cascadia manually entered responses into the online survey database. A copy of the survey is included in Appendix A of this memo for reference. The following analysis summarizes the compiled survey results and presents associated graphical summaries, maps, and key themes. All survey respondents indicated that they are Kirkland residents.

Awareness

42% of respondents were unsure whether polluted stormwater runoff is a problem (n=118). 75% of respondents are unsure where water goes after it enters a storm drain or roadside ditch (n=118). These uncertainties present potential opportunities for education and outreach.

Q7 In Kirkland, would you say that polluted stormwater runoff is?

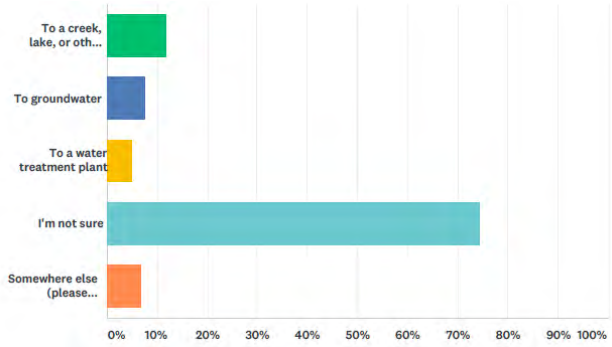
Answered: 118 Skipped: 6



ANSWER CHOICES	RESPONSES	
A big problem	12%	14
A moderate problem	24%	28
A small problem	12%	14
Not a problem	10%	12
I'm not sure	42%	50
TOTAL		118

Q6 In your neighborhood, where does the water that runs off your lawn and pavement (such as from rain, outdoor washing, or lawn watering) go after it enters a storm drain or roadside ditch?

Answered: 118 Skipped: 6



ANSWER CHOICES	RESPONSES	
To a creek, lake, or other body of water	12%	14
To groundwater	8%	9
To a water treatment plant	5%	6
I'm not sure	75%	88
Somewhere else (please describe)	7%	8
Total Respondents: 118		

Reported Drainage Issues

The survey asked respondents how often they observed excess or standing water in the following areas:

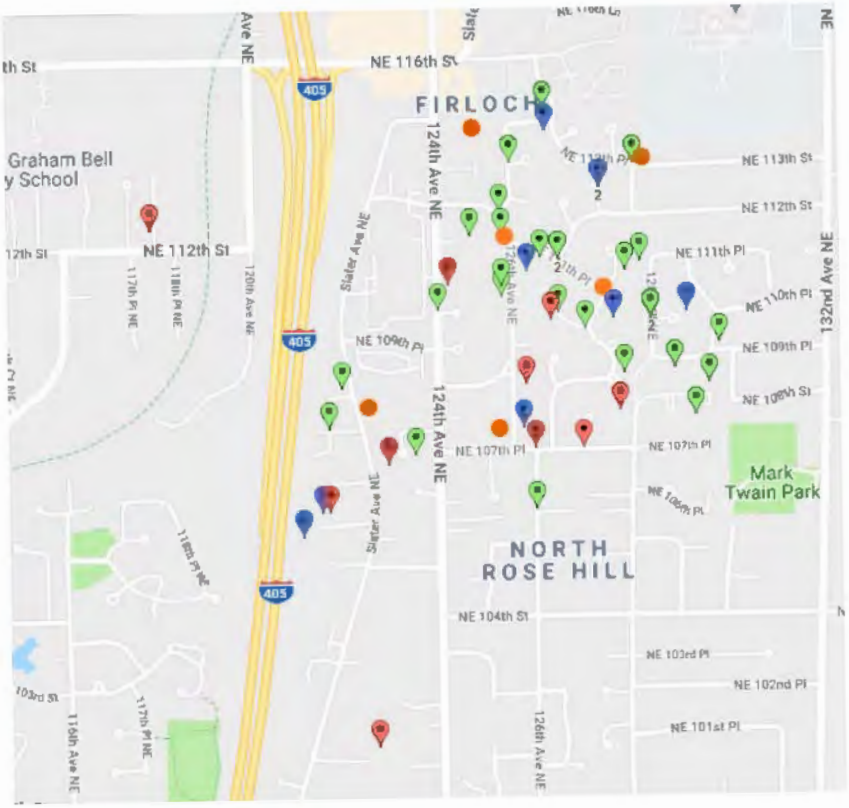
- **Q2**: How often do you have excess or standing water **on your street** (for example, large puddles in the street that last for several days)?
- **Q3**: How often do you have excess or standing water **on the property where you live** (for example, large puddles that last for several days)?
- **Q4**: How often do you have water entering into **your basement or crawl space**, from natural springs, groundwater, or other sources of outside water?

The table below summarizes responses to Q2, Q3, and Q4 for comparison:

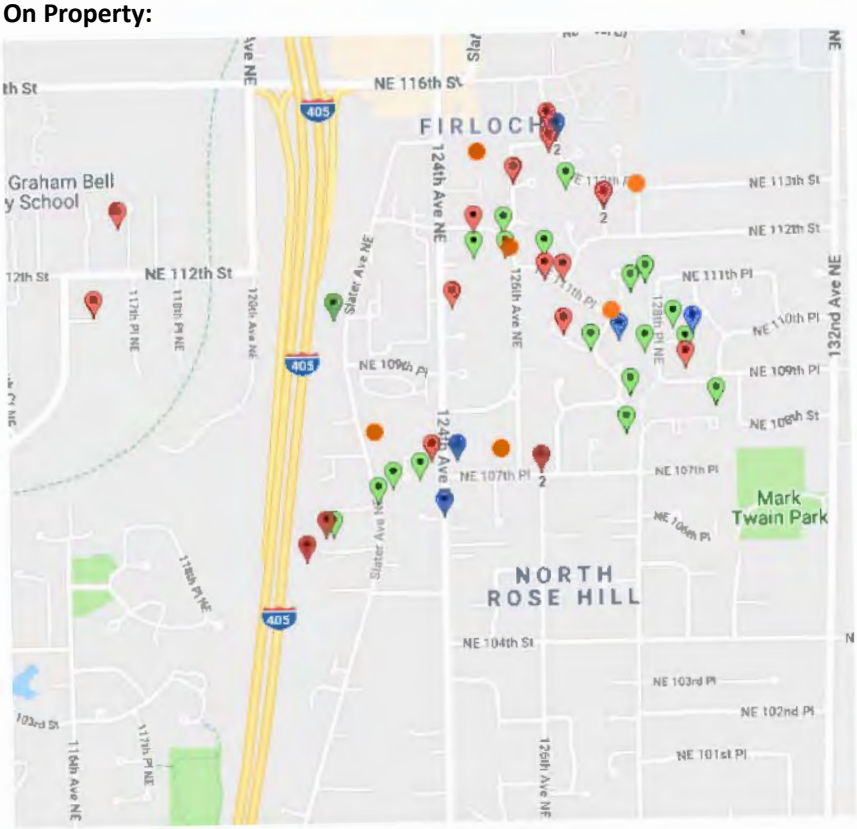
	On street		On property		Basement	
	#	%	#	%	#	%
I don't have a basement/crawlspace					2	2%
Not sure	4	3%	2	2%	10	8%
Never	66	56%	69	58%	84	71%
Rarely (less than once/year)	29	25%	22	19%	11	9%
Once or twice/year	8	7%	6	5%	4	3%
>2x /year	10	9%	19	16%	7	6%
Total Respondents	**117**		**118**		**118**	

The following maps highlight geographic locations of Q2, Q3, and Q4 respondents, grouped by how frequently they observe excess water on their street, property, and basement/crawlspace. More than twice per year is indicated in red, once or twice a year is indicated in blue. Rarely (less than once per year) is indicated in green. The top six potential site locations are indicated in orange.

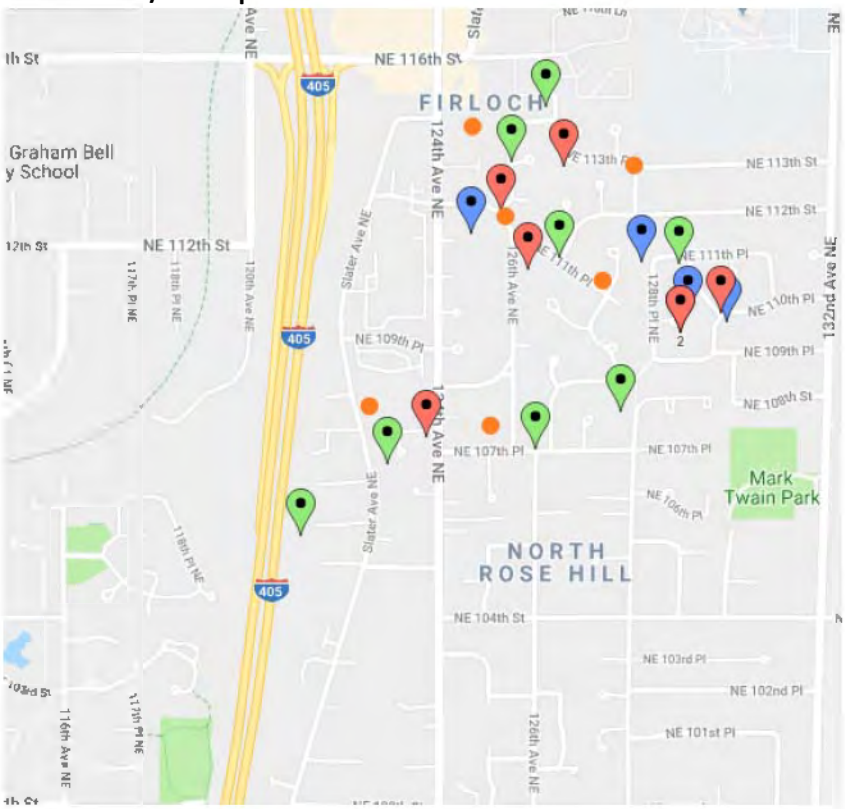
On Street:



On Property:



In Basement/Crawlspace:



Potential Drainage Improvement Projects

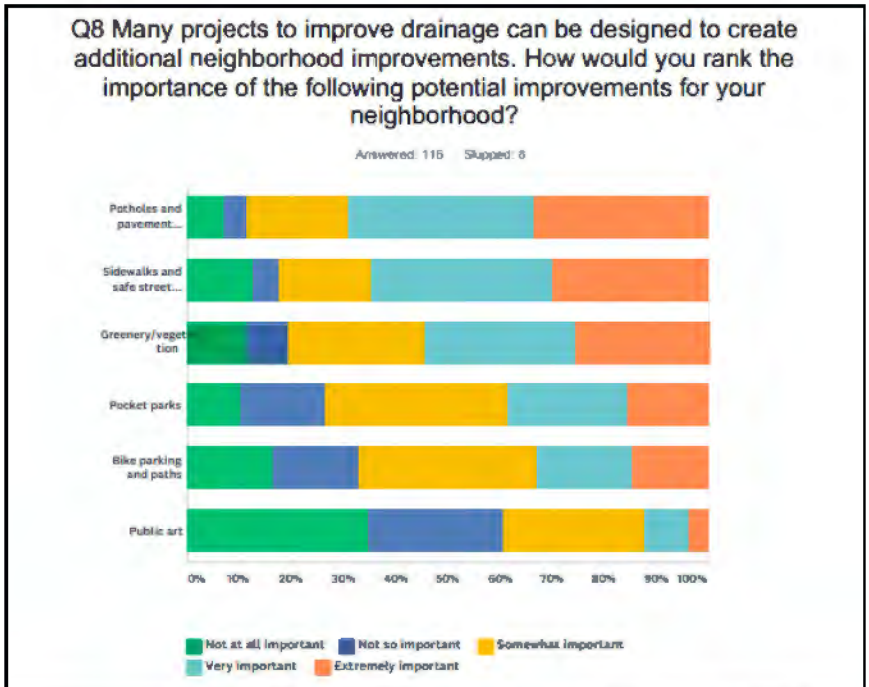
Q8 asked respondents to rank potential drainage improvement projects by the importance for their neighborhood. We used a weighted scale to rank each potential project overall, with zero points per respondent for projects ranked as "not at all important" and four points per respondent for projects ranked "extremely important":

Not at all important	Not so important	Somewhat important	Very important	Extremely important
0	1	2	3	4

Using this weighted scale, we ranked preference for potential improvement projects as follows:

- Potholes & Pavement = 324 points
- Sidewalks & Safe Street Crossings = 299 points
- Greenery & Vegetation = 284 points
- Pocket Parks = 237 points
- Bike Parking & Paths = 216 points
- Public Art = 135 points

The chart below provides a summary of overall rankings:



	NOT AT ALL IMPORTANT	NOT SO IMPORTANT	SOMEWHAT IMPORTANT	VERY IMPORTANT	EXTREMELY IMPORTANT	TOTAL
Potholes and pavement condition	7% 8	4% 5	19% 22	36% 41	33% 38	114
Sidewalks and safe street crossings	12% 14	5% 6	18% 20	35% 39	30% 34	113
Greenery/vegetation	11% 13	8% 9	26% 30	29% 33	25% 29	114
Pocket parks	10% 11	17% 18	35% 38	23% 25	16% 17	109
Bike parking and paths	17% 18	17% 18	34% 37	18% 20	15% 16	109
Public art	35% 39	26% 29	27% 30	9% 10	4% 4	112

Q9 provided respondents with an open-ended option to provide other improvements that would be important for their neighborhood. We coded these responses into general themes, summarized in the table below. Note that we coded individual responses into multiple themes as needed.

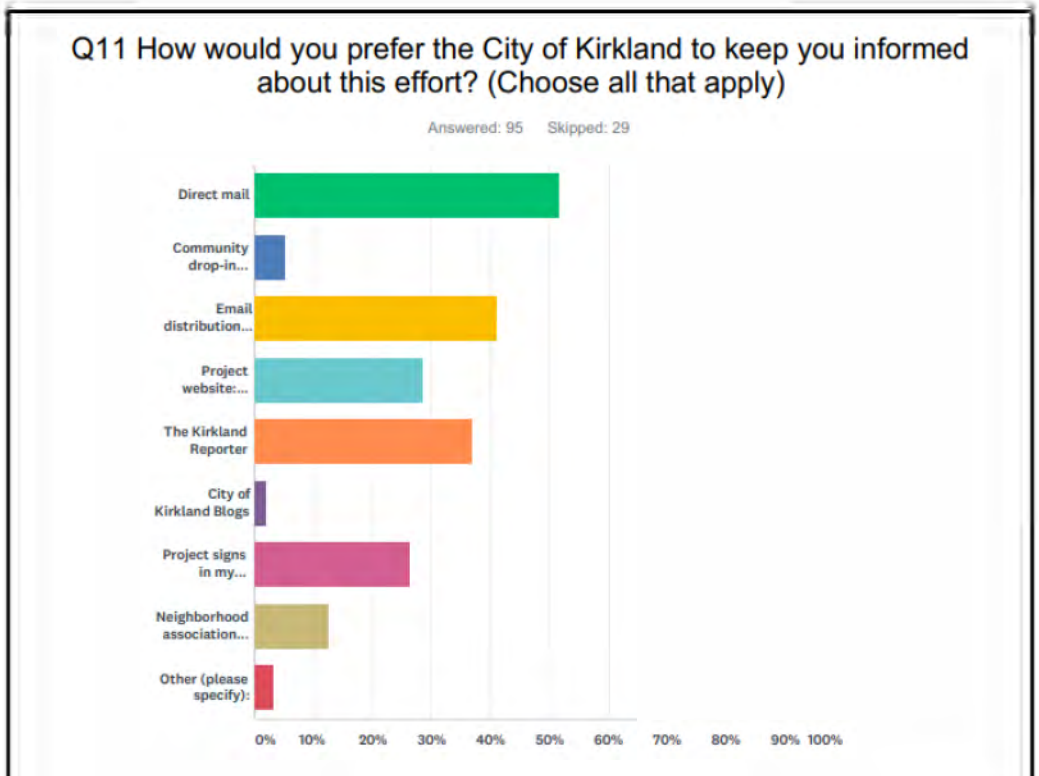
Theme:	Individual Responses:
Community Space	• there is an empty lot intended for a park at NE 110th Pl + 132nd Ave NE. we would love a park or green space here • common areas in our community • upkeep of community walking/biking paths • I would like to see the city purchase and preserve existing privately-owned green space. I would like to see additional traffic calming installed on Slater Ave NE south of NE 112th Place • Mark Twain Park is in our neighborhood. A drinking fountain is long overdue. The park is even next to a water tower. If that's not relevant, new construction is going in nearby, with new water lines.

Theme:	Individual Responses:
Flooding	• I have a special issue (private property). I live down slope along SPU power line. 1960 house - county installed 2 catch basins along base of down slope that kept ditched (?) so water enters catch basin. At times ditch is full to overflowing during heavy rain. Overflow would come into my back lawn. Would love for you to visit and see it. Will send photos. • reduce flooding • WHEN the next condo set goes in somewhere in 85th or 116th, put in something big for retention. • This survey is about storm water. Across from Costco is a residential property that has been turned into a documented, perpetual wetland by decades of Costco development. Please help our neighbors there first, even if it's just buying the property and turning it into a wetland park.
Greenery & Landscaping	• I have asked street sweeper with City of Kirkland to sweep more often, especially in winter & autumn. They sweep 1 block north of my development but "skip" our neighborhood! We have many evergreen trees (large) and the needles go down the storm drains! • greenery, vegetation, and trees are overgrown, full of weeds and trash • catching dead trees in green belt way • No more city planting trees in planting strips - they destroy the sidewalks, are almost always under utility lines and never get maintained • there is an empty lot intended for a park at NE 110th Pl + 132nd Ave NE. we would love a park or green space here • Street light at intersection of NE 110th Pl + 124th Ave NE, trim large trees at same spot • less homes more green plants need the water/roads dont • keeping trees and branches trimmed away from sidewalks and stop signs • LID principles, rain gardens, bioswales, etc • Over growing stelter and blackberry bushes in reservoir in backyard, its technically city property • We are upset that the area on the 116th St. exits off of 405 are so neglected with no landscaping • Trees removal. There are a lot of trees damaging properties and fences. That would be great to fix this before turns a bigger problem. • I would like to see the city purchase and preserve existing privately-owned green space. I would like to see additional traffic calming installed on Slater Ave NE south of NE 112th Place
Lighting	• Street & path lighting. • Street light at intersection of NE 110th Pl + 124th Ave NE, trim large trees at same spot • sidewalks on 124th Ave NE, street lights
New Construction	• traffic planning for all the development on 132nd and 124th • there is an empty lot intended for a park at NE 110th Pl + 132nd Ave NE. we would love a park or green space here • less homes more green plants need the water/roads dont • LID principles, rain gardens, bioswales, etc • grid + infrastructure reliability • WHEN the next condo set goes in somewhere in 85th or 116th, put in something big for retention.

Theme:	Individual Responses:
	• This survey is about storm water. Across from Costco is a residential property that has been turned into a documented, perpetual wetland by decades of Costco development. Please help our neighbors there first, even if it's just buying the property and turning it into a wetland park. • Mark Twain Park is in our neighborhood. A drinking fountain is long overdue. The park is even next to a water tower. If that's not relevant, new construction is going in nearby, with new water lines.
Public Litter Cans & Cleanup	• greenery, vegetation, and trees are overgrown, full of weeds and trash • Two more trash cans would be nice in North Rose Hill Neighborhood • Porta-potty at Mark Twain Park, Trash can by the playground
Safety, Security & Enforcement	• enforcement of current laws with regards to parking (vehicles that dont move) oversize RVs etc. • security from burglary • on 124th crosswalks are not well indicated please make more noticeable the crosswalk features
Sidewalks & Paving	• paving and better care for a pedestrian path next to me • sidewalks at 107th Pl & 128th • slowing down traffic on slater avenue and having sidewalks • water leak fixed years ago on street in front of house. sidewalks replaced with asphalt stated would be back to fix with cement. city never has replace sidewalk cement • sidewalks on slater ave NE • sidewalks + a speed bump • sidewalks • sidewalks on 124th Ave NE, street lights • upkeep of community walking/biking paths
Street Sweeping	• I have asked street sweeper with City of Kirkland to sweep more often, especially in winter & autumn. They sweep 1 block north of my development but "skip" our neighborhood! We have many evergreen trees (large) and the needles go down the storm drains! • increase frequency of street sweepers • our street (128th Ave NE) is rarely swept. The drain fills up. The workmen come!!
Traffic & Intersections	• traffic lights in intersection of 132nd ave /100th - wow - what a mess. very unsafe. • slowing down traffic on slater avenue and having sidewalks • traffic planning for all the development on 132nd and 124th • control 405 bypass traffic • improved sight distance at intersections and curved streets - at 124th NE & at 108th b/w 124 & 126 • on 124th crosswalks are not well indicated please make more noticeable the crosswalk features • reducing traffic congestion on 132nd Ave • Left turn lanes the entire length of 132nd Ave NE • grid + infrastructure reliability • I would like to see the city purchase and preserve existing privately owned green space. I would like to see additional traffic calming installed on Slater Ave NE south of NE 112th Place • mass transit within reasonable distance

Communications Preferences

63% of respondents said they would like the City of Kirkland to stay in touch about the drainage improvement efforts (n=107). 95 of the respondents who indicated "yes" or "maybe" to staying in touch about the project reported communication preferences, summarized in the graph below. Note that respondents were able to choose more than one communication method.



ANSWER CHOICES	RESPONSES	
Direct mail	52%	49
Community drop-in sessions or events	5%	5
Email distribution list	41%	39
Project website: kirklandwa.gov/ForbesCreek	28%	27
The Kirkland Reporter	37%	35
City of Kirkland Blogs	2%	2
Project signs in my neighborhood	26%	25
Neighborhood association communications	13%	12
Other (please specify):	3%	3
Total Respondents: 95		

14 of the **hardcopy** survey respondents who indicated that they would **not** like the City of Kirkland to keep them informed of project updates still provided the following communication preferences:

- The Kirkland Reporter (9)
- Project Website: kirklandwa.gov/ForbesCreek (7)
- Direct Mail (3)
- Project Signs in My Neighborhood (3)
- Neighborhood Associated Communications (2)

Appendix A: Drainage in Your Community Survey

We need your help! The City of Kirkland is currently planning projects to improve drainage around the city. We are seeking your input to help us learn about your neighborhood's specific drainage and community needs. Please help us by filling out this quick survey. It should take about 5 minutes to complete. Thank you for participating.

Alternative language formats of this publication are available upon request. The City of Kirkland's policy is to prohibit discrimination against any person on the basis of race, color, national origin, or sex in the provision of its program's benefits and services. For information, contact 425-587-3975 or TitleVICoordinator@kirklandwa.gov.

1. **This survey is intended for people living in the City of Kirkland. Do you live in Kirkland?**

   - o Yes, I live in Kirkland.
   - o No, but I want to take the survey anyway.

2. **How often do you have excess or standing water on your street (for example, large puddles in the street that last for several days)?**

   - o Never
   - o Rarely (less than once a year)
   - o Once or twice a year
   - o More than twice a year
   - o I'm not sure

3. **How often do you have excess or standing water on the property where you live (for example, large puddles that last for several days)?**

   - o Never
   - o Rarely (less than once a year)
   - o Once or twice a year
   - o More than twice a year
   - o I'm not sure

4. **How often do you have water entering your basement or crawl space, from natural springs, groundwater, or other sources of outside water?**

   - o Never
   - o Rarely (less than once a year)
   - o Once or twice a year
   - o More than twice a year
   - o I'm not sure
   - o I don't have a basement or crawl space

5. **What is the nearest street intersection to where you live in Kirkland?**

   - o Street you live on: _____
   - o Nearest cross-street: _____

6. **In your neighborhood, where does the water that runs off your lawn and pavement (such as from rain, outdoor washing, or lawn watering) go after it enters a storm drain or roadside ditch?**

   - o To a creek, lake, or other body of water
   - o To groundwater
   - o To a water treatment plant
   - o I'm not sure
   - o Somewhere else (please describe) _____

7. **In Kirkland, would you say that polluted stormwater runoff is?**

   - o A big problem
   - o A moderate problem
   - o A small problem
   - o Not a problem
   - o I'm not sure

8. **Many projects to improve drainage can be designed to create additional neighborhood improvements. How would you rank the importance of the following potential improvements for your neighborhood?**

	Not at all important	Not so important	Somewhat important	Very important	Extremely important
Greenery/vegetation	O	O	O	O	O
Sidewalks and safestreet crossings	O	O	O	O	O
Pocket parks	O	O	O	O	O
Bike parking and paths	O	O	O	O	O
Public art	O	O	O	O	O
Potholes and pavement condition	O	O	O	O	O

9. **Are there other improvements that would be important for your neighborhood?** _____

10. **Would you like the City of Kirkland to stay in touch about this effort?**

   - o Yes
   - o Maybe
   - o No

11. **How would you prefer the City of Kirkland to keep you informed about this effort? (Choose all that apply)**

    - o Direct mail
    - o Community drop-in sessions or events
    - o Email distribution list
    - o Project website: kirklandwa.gov/ForbesCreek
    - o The Kirkland Reporter
    - o City of Kirkland Blogs
    - o Project signs in my neighborhood
    - o Neighborhood association communications
    - o Other (please specify): _____

12. **If you would like the City of Kirkland to keep in touch about this effort, please provide your contact information.**

Name _____
Street Address _____
Zip Code _____
Email Address _____
Phone Number _____

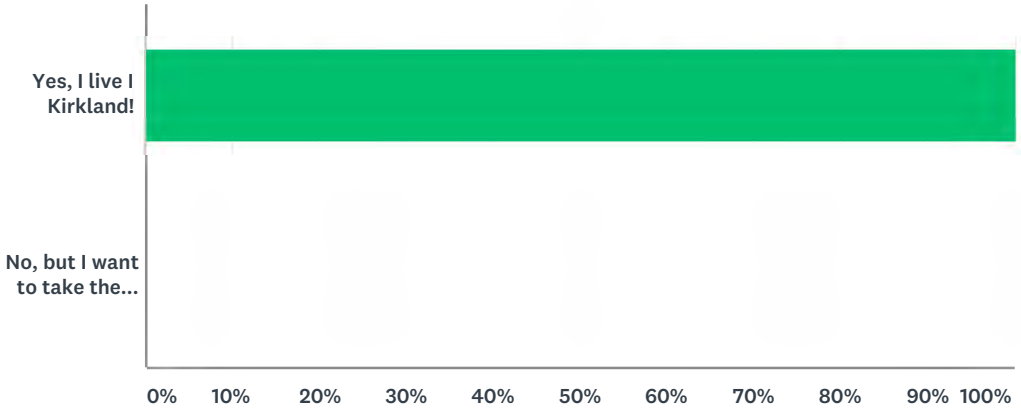
Please put your completed survey in the self-addressed stamped envelope and mail it to us.

Thank you for your time.

Information you provide to the City of Kirkland, including personal contact information, is subject to the Washington State Public Records Act (Chapter 42.56 RCW), and may be subject to disclosure to a third-party requestor, regardless of any claim of confidentiality or privilege you or others may assert.

Q1 This survey is intended for people living in the City of Kirkland. Do you live in Kirkland?

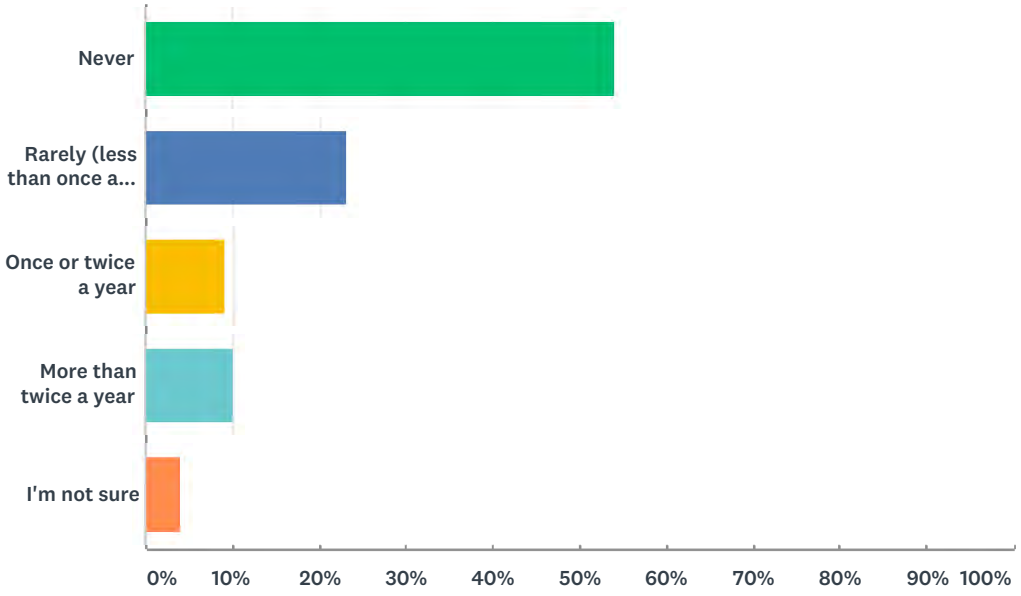
Answered: 107 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, I live I Kirkland!	100.00%	107
No, but I want to take the survey anyway.	0.00%	0
TOTAL		107

Q2 How often do you have excess or standing water on your street (for example, large puddles in the street that last for several days)?

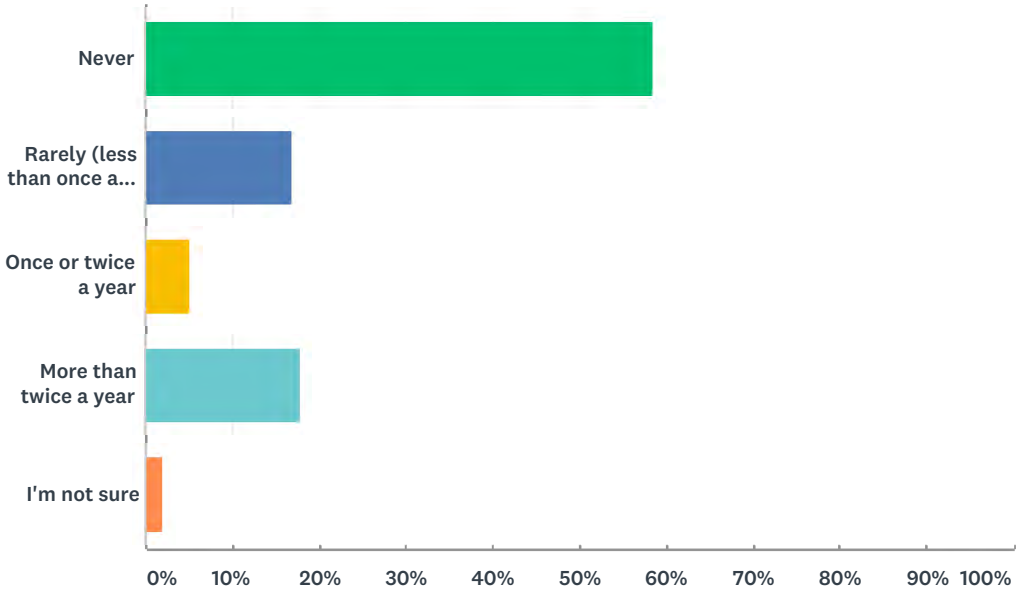
Answered: 100 Skipped: 7



ANSWER CHOICES	RESPONSES	
Never	54.00%	54
Rarely (less than once a year)	23.00%	23
Once or twice a year	9.00%	9
More than twice a year	10.00%	10
I'm not sure	4.00%	4
TOTAL		100

Q3 How often do you have excess or standing water on the property where you live (for example, large puddles that last for several days)?

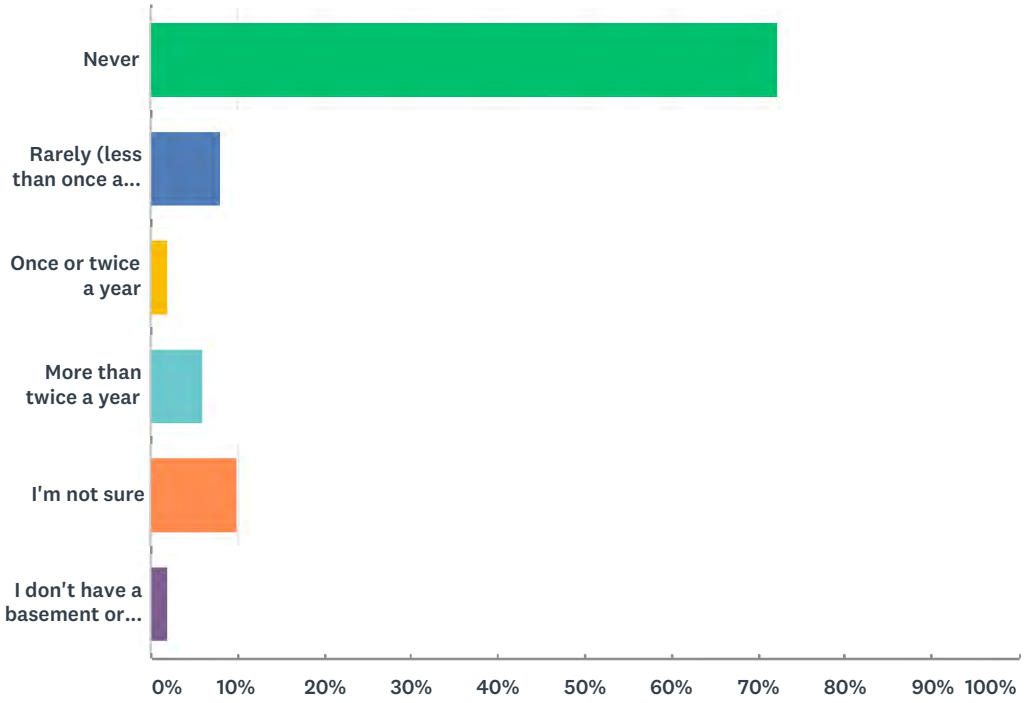
Answered: 101 Skipped: 6



ANSWER CHOICES	RESPONSES	
Never	58.42%	59
Rarely (less than once a year)	16.83%	17
Once or twice a year	4.95%	5
More than twice a year	17.82%	18
I'm not sure	1.98%	2
TOTAL		101

Q4 How often do you have water entering into your basement or crawl space, from natural springs, groundwater, or other sources of outside water?

Answered: 101 Skipped: 6



ANSWER CHOICES	RESPONSES	
Never	72.28%	73
Rarely (less than once a year)	7.92%	8
Once or twice a year	1.98%	2
More than twice a year	5.94%	6
I'm not sure	9.90%	10
I don't have a basement or crawl space	1.98%	2
TOTAL		101

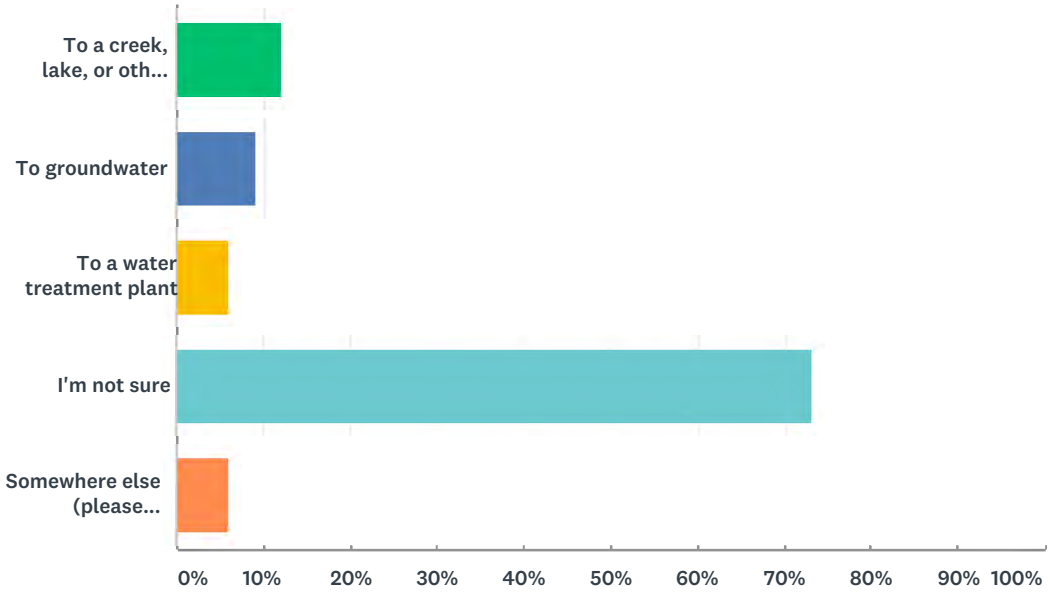
Q5 What is the nearest street intersection to where you live in Kirkland?

Answered: 101 Skipped: 6

ANSWER CHOICES	RESPONSES	
Street you live on:	100.00%	101
Nearest cross-street:	95.05%	96

Q6 In your neighborhood, where does the water that runs off your lawn and pavement (such as from rain, outdoor washing, or lawn watering) go after it enters a storm drain or roadside ditch?

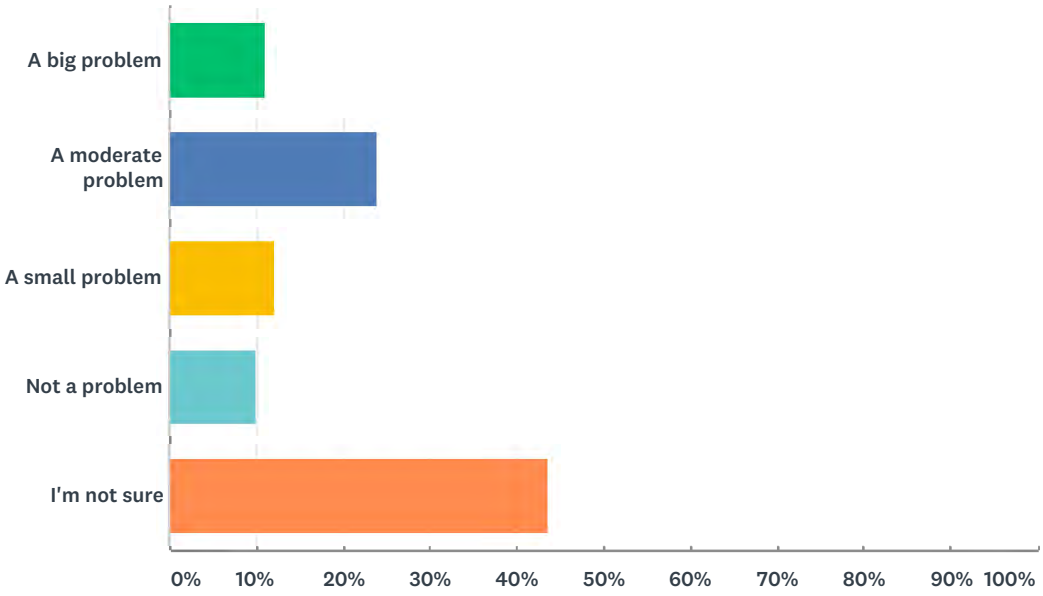
Answered: 101 Skipped: 6



ANSWER CHOICES	RESPONSES	
To a creek, lake, or other body of water	11.88%	12
To groundwater	8.91%	9
To a water treatment plant	5.94%	6
I'm not sure	73.27%	74
Somewhere else (please describe)	5.94%	6
Total Respondents: 101		

Q7 In Kirkland, would you say that polluted stormwater runoff is?

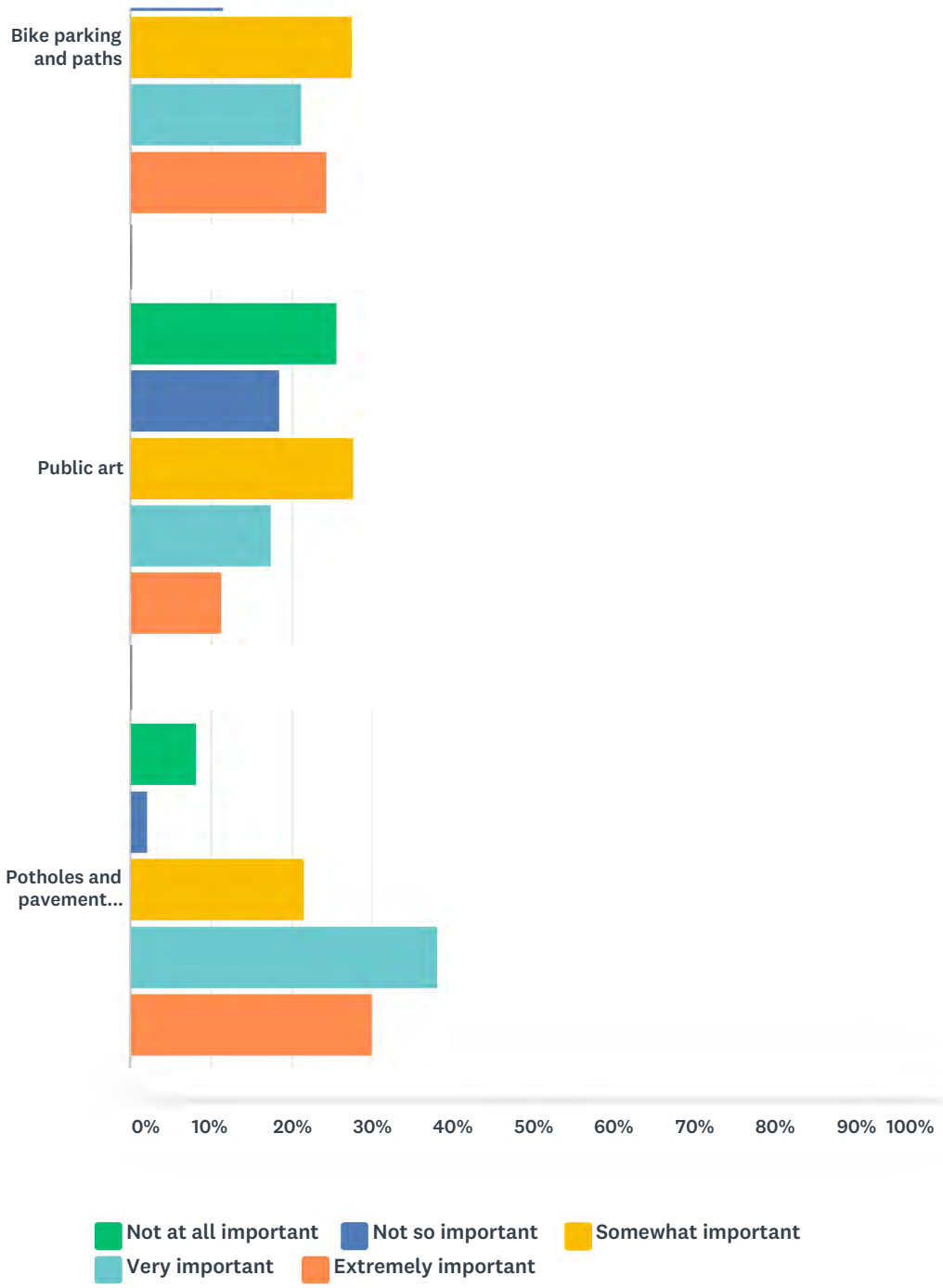
Answered: 101 Skipped: 6



ANSWER CHOICES	RESPONSES	
A big problem	10.89%	11
A moderate problem	23.76%	24
A small problem	11.88%	12
Not a problem	9.90%	10
I'm not sure	43.56%	44
TOTAL		101

Q8 Many projects to improve drainage can be designed to create additional neighborhood improvements. How would you rank the importance of the following potential improvements for your neighborhood?

Answered: 99 Skipped: 8



	NOT AT ALL IMPORTANT	NOT SO IMPORTANT	SOMEWHAT IMPORTANT	VERY IMPORTANT	EXTREMELY IMPORTANT	TOTAL
Greenery/vegetation	24.21% 23	13.68% 13	25.26% 24	18.95% 18	17.89% 17	95
Sidewalks and safe street crossings	16.84% 16	10.53% 10	24.21% 23	30.53% 29	17.89% 17	95
Pocket parks	10.75% 10	15.05% 14	35.48% 33	23.66% 22	15.05% 14	93
Bike parking and paths	15.79% 15	11.58% 11	27.37% 26	21.05% 20	24.21% 23	95
Public art	25.51% 25	18.37% 18	27.55% 27	17.35% 17	11.22% 11	98

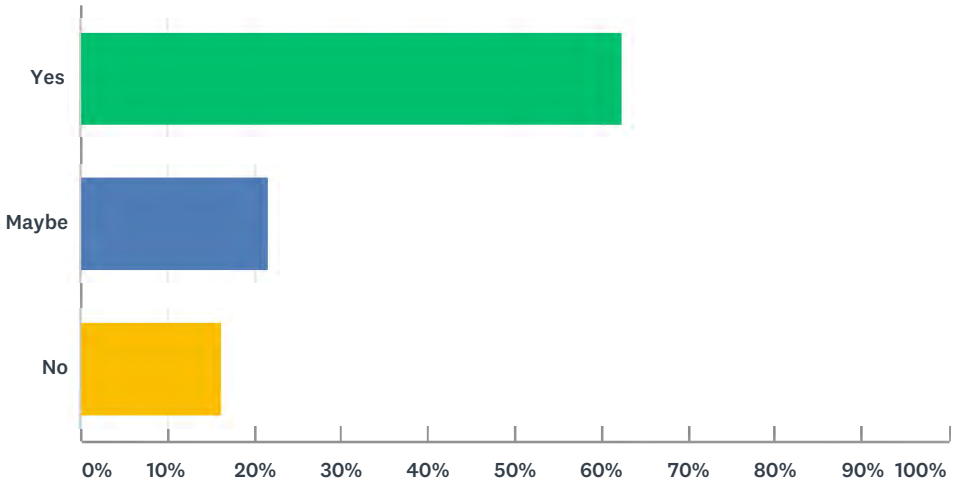
Potholes and pavement condition	8.25% 8	2.06% 2	21.65% 21	38.14% 37	29.90% 29	97

Q9 Are there other improvements that would be important for your neighborhood?

Answered: 45 Skipped: 62

Q10 Would you like the City of Kirkland to stay in touch about this effort?

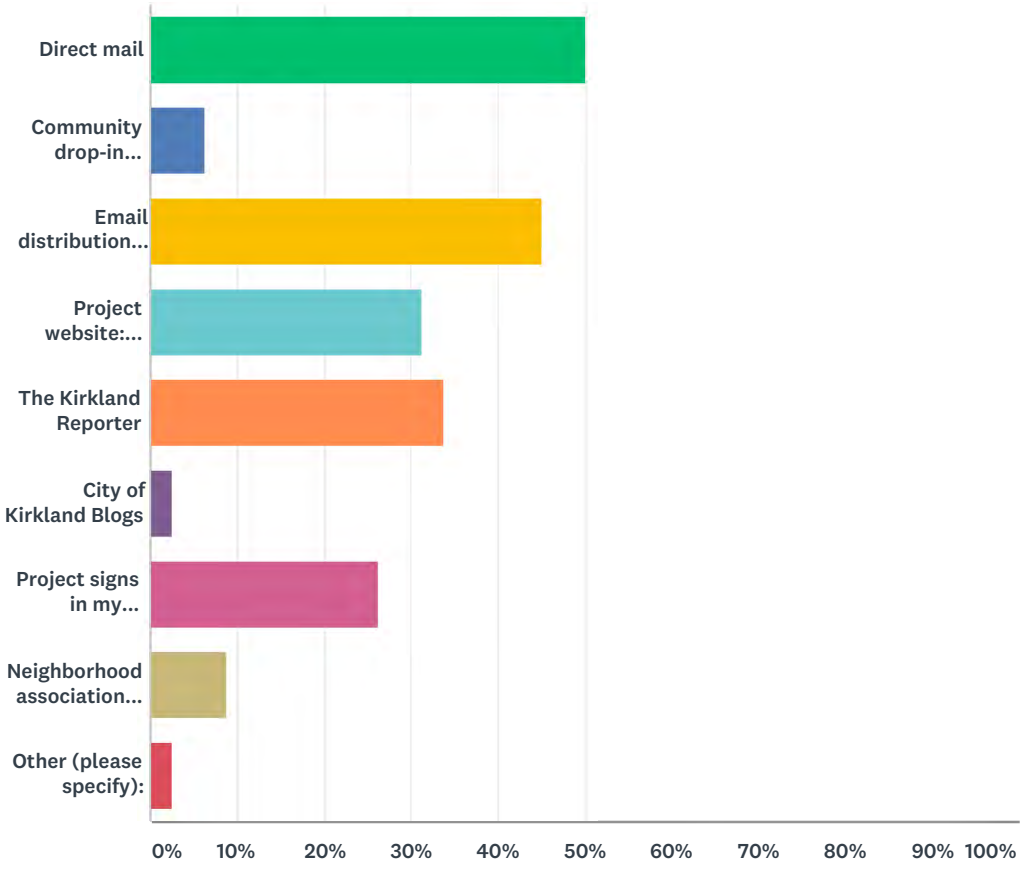
Answered: 93 Skipped: 14



ANSWER CHOICES	RESPONSES	
Yes	62.37%	58
Maybe	21.51%	20
No	16.13%	15
TOTAL		93

Q11 How would you prefer the City of Kirkland to keep you informed about this effort? (Choose all that apply)

Answered: 80 Skipped: 27

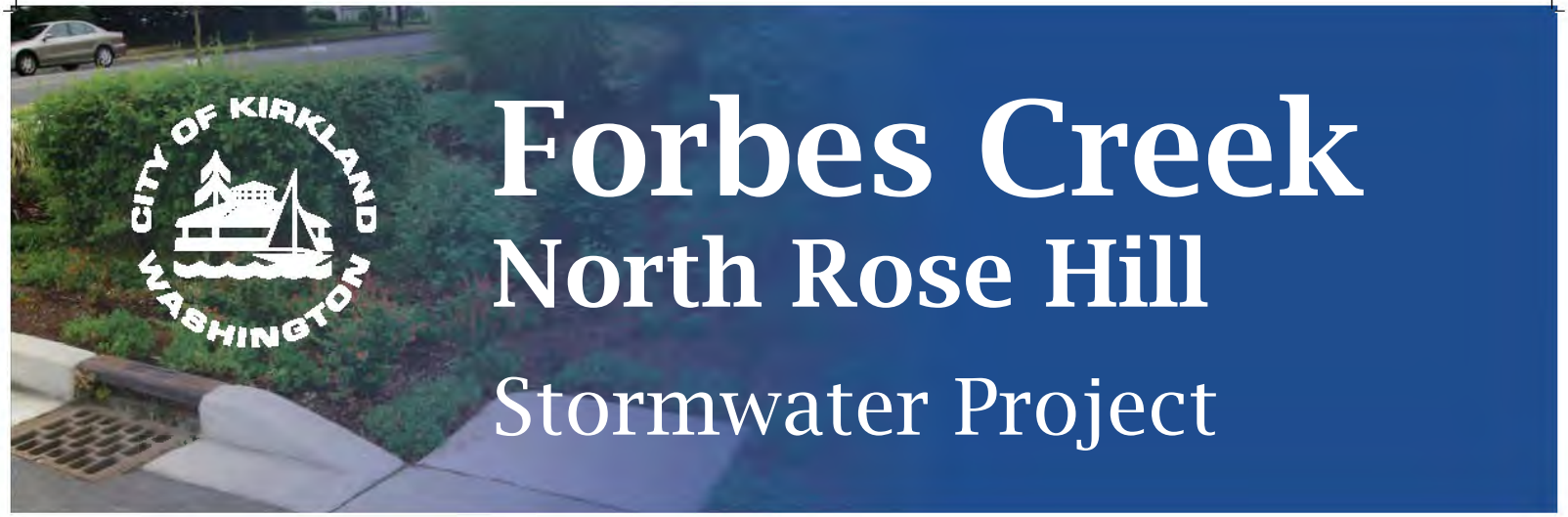


ANSWER CHOICES	RESPONSES	
Direct mail	50.00%	40
Community drop-in sessions or events	6.25%	5
Email distribution list	45.00%	36
Project website: kirklandwa.gov/ForbesCreek	31.25%	25
The Kirkland Reporter	33.75%	27
City of Kirkland Blogs	2.50%	2
Project signs in my neighborhood	26.25%	21
Neighborhood association communications	8.75%	7
Other (please specify):	2.50%	2
Total Respondents: 80		

Q12 If you would like the City of Kirkland to keep in touch about this effort, please provide your contact information.

Answered: 61 Skipped: 46

ANSWER CHOICES	RESPONSES	
Name	96.72%	59
Company	0.00%	0
Street Address	93.44%	57
Address 2	0.00%	0
City/Town	0.00%	0
State/Province	0.00%	0
ZIP Code	95.08%	58
Country	0.00%	0
Email Address	78.69%	48
Phone Number	9.84%	6



Forbes Creek
North Rose Hill
Stormwater Project

How were these potential project locations identified?

City staff and consultants identified more than twenty possible sites after reviewing maps and walking the North Rose Hill Basin. The twenty possible sites were narrowed to twelve based on engineering feasibility and potential environmental benefit. Of the twelve, these five potential project sites rated the highest against the following criteria:

- Water quality improvement
- Flooding risk reduction
- Potential community benefits (aesthetics, sidewalks, passive recreation

Project Feasibility and Benefits

Each potential project location was evaluated against a set of criteria to characterize project feasibility and potential benefits to the environment and to the community. Criteria included:

Feasibility

- Land/right-of-way availability
- Engineering feasibility
- Permitting feasibility

Benefit

- Flood risk reduction benefit
- Water quality benefit
- Potential for community benefits

What's next?

With your input, the City of Kirkland will select the top three locations from the five potential project locations. Once the top three project locations are selected, we need your help to further refine each project as part of the preliminary design process planned for the next few months.

For more information, and to provide input during preliminary design, contact:

Jenny Gaus
425-587-3850
jgaus@kirklandwa.gov

or visit:
www.kirklandwa.gov/ForbesCreek

Stormwater Management Techniques

Our preliminary concepts for each of these five potential projects include one or more stormwater management techniques:

Storage: Temporary storage of stormwater in retention ponds or underground vaults reduces the chance of flooding downstream and reduces erosion by lowering stormwater velocity.

Infiltration: Infiltration of stormwater into the ground through installed wells reduces the chance of flooding downstream.

Treatment: Water quality treatment of stormwater using either proprietary treatment devices or underground vaults removes pollutants from stormwater.

Bioretention: Also called rain gardens or natural drainage systems, bioretention cells provide storage that reduces the chance of flooding downstream and removes pollutants from stormwater.

Forbes Creek
North Rose Hill
Stormwater Project

Let's work together for cleaner water and a healthier environment in our community!

What is stormwater
...and why is it a problem?

Stormwater is water that falls during a rainstorm or melting snow. Hard surfaces such as roadways and rooftops do not allow stormwater to soak into the ground. Lots of water running over hard surfaces can lead to flooding. Stormwater runoff also picks up pollutants from the ground and transports them to the nearest storm drain and eventually to local waterways, contaminating water quality and harming fish and other wildlife.

How will this project
address stormwater problems?

Stormwater projects will be installed at three sites in the North Rose Hill basin neighborhood to help slow and clean stormwater runoff and help rain soak into soil to address flooding concerns and reduce drainage issues. Project installations can vary greatly, ranging from rain gardens to underground storage containers.

Potential benefits of these projects include:

- **Greener, more attractive neighborhoods**
- **Lower risk of street and property flooding**
- **Improved water quality for ecosystems and recreation**
- **Calmer traffic patterns**
- **Healthier Forbes Creek**

PHASE 1 TIMELINE

COMMUNITY ENGAGEMENT

TECHNICAL ANALYSIS

- **Brainstorm & identify preliminary options**
- **Community survey to identify preliminary priorities**
- **Screen preliminary options to 6 sites**
- **Drop-in sessions and community involvement** — *We are here*
- **Evaluate options and select 3 to recommend**

→ **PHASE 2: DESIGN & CONSTRUCTION**

For more information, visit www.kirklandwa.gov/ForbesCreek

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North Rose Hill
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Name	Address	City/Zip	Phone	Email	How did you hear about this session?	How do you currently use or travel through this space?	If you do not currently use it, how could you see yourself using it?	How do you see other people using this space?	If this project moves forward, what elements would enhance the overall space?	Based on this description, how supportive are you of this project?	Additional feedback:
Rodger Neal	12403 NE 107th Pl	Kirkland, 98033				Does not use space	If there was a better barrier and people picked up after their dogs, he would bring his grandson here. if it looked more inviting he might use it	Maybe - dog walkers!	Benches?! veg so soccer balls won't roll	Yes, as long as they don't charge him more. Concern - taxes are already too high!	Concern - please no ponding (none now); currently less flooding issues than when he moved here; @124th / 107th - flooding currently (small inlet); gutter flow on S side of 107th (a lot - can we get this flow in here?); lots of traffic here!
Kevin Coomer	11001 126th Ave NE	Kirkland	(206) 303-8850	kevincoomer44@gmail.com	Mailers	Does not use space	Off-leash dog park; small interpretive center; lots of families - pocket park; traffic calming.	Please consider: put this in along/under the powerline - have sewer already could be a trail	Trails, dog park		Likes Sites 1, 3, 5; likes idea of trails that cut through neighborhoods; Site 5 - having issues for years but seems to have improved. Tie Site 3 into greenways project?
Julie Nebel	12228 NE 100th	Kirkland	(206) 601-7473		Online				Wants native plants and improved bee/bug habitat.	Likes the idea of improving the pond at Site 1 - yes please!	She lives south by the fire station; she has a drainage complaint about the culvert there; Jenny please reach out; 1 lane of traffic would be hard at Site 5 because people cut through; castle park has standing water; water fowl/dragon flies are going away; changed culvert 124th - don't clean out.
John Carpenter	10927 126th Ave NE	Kirkland, 98033		carpenterbj101@gmail.com	Mailer/in person						Don't want to lose parking; provided feedback to Lynn during D2D outreach.

Name	Address	City/Zip	Phone	Email	How did you hear about this session?	How do you currently use or travel through this space?	If you do not currently use it, how could you see yourself using it?	How do you see other people using this space?	If this project moves forward, what elements would enhance the overall space?	Based on this description, how supportive are you of this project?	Additional feedback:
Alex Jones	11328 126th Ave NE	Kirkland		xuduality@gmail.com		Mow it; kids go back there	Nice open area for playing	Unusuable; currently overgrown; city levels	Nice grass park; wife would love it	concern - Dub Pub, drunk traffic / people walking up from the bar;	Poplars throw root balls every few years - remove poplars; only hesitation is foot traffice; need fence; think that cars fly by their section of road - interested in traffic calming;
Wife	11329 (property next t	Kirkland									How would people access it? How wide is property access? Are there better sites? Seems steep - would people slip and fall? Access would seem to make sense from west side.
Husband	11329 (property next t	Kirkland									Was filming outreach team and said he would contact his lawyer; concerns regarding land ownership, does not want people cutting through the back area; wants info on public hearing; will call/email Jenny

PIN	TaxpayerName	AttnLine	AddrLine	East/West Side	CityState	ZipCode	Team Member	Action	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Other feedback:
8679600120	BETTINGER TONYA A		11019 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600250	BRAVO ARTEMIO-REY C+JESSICA		11102 126TH AVE NE	East	KIRKLAND WA	98033	Lynn	Door hanger									
8679600260	BUCK LEONARD		11026 126TH AVE NE	East	KIRKLAND WA	98033	Lynn	Door hanger									
8679600080	CARPENTER JOHN LYLE		10927 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Gave feedback; took open house postcard.	Very unsupportive	Very unsupportive	N/A	N/A	Neighbors can have 4 cars. Busy at night and on weekends. Cars are parked on the grass because there's no room.	N/A	N/A	No preference	Wants to keep everything as is; 2 lanes of parking + 2 lanes of travel. River coming down driveway. Cul de sac sd gets really full; overflowing; worried about.
8679600090	COOMER KEVIN ROYCE+CATALINA		11001 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600150	DESANTIS CURTIS J		11105 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600330	GUPTA ASHISH K		10810 126th Ave NE	East	Kirkland WA	98033	Angela	Completed survey.	Somewhat unsupportive	Somewhat unsupportive	Somewhat unwilling	Increase	6 people live in this residence; most of them have more than 1 car; lots of cars - definitely more at night.	Neither	Sidewalk between bioretention gardens and property line.	1 travel lane with parking on both sides of street.	Concerned about construction impacts and losing parking. Likes having a wide road and plenty of parking.
8679600340	HODZIC MENSUD+ASIMA		10802 126TH AVE NE	East	KIRKLAND WA	98033	Angela	Door hanger									
2423010310	JESSICA VERRE		12617 N.E. 110TH ST.	East	KIRKLAND WA	98033	Angela	Could not find address									
8679600310	KATHIRESAN RAMANATHAN+ROZE		10914 126TH AVE NE	East	KIRKLAND WA	98033	Angela	Man who answered door said he was parent of homeowners. Will pass along to them when they get home.									
8679600100	LANGE FAMILY PROPERTY TRUST	LANGE JACQUELINE+RICHARD TT	11007 126th Ave NE	West	Kirkland WA	98033	Lynn	Door hanger									
8679600040	LAZZ RANDY S+BARBARA L		10811 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Was pruning trees and did not want to give feedback; did not accept door hanger bag									
8679600360	LE CHINH DUAT+HIEN DIU PHAN		10744 126TH AVE NE	East	KIRKLAND WA	98033	Angela	Completed survey.	Very supportive	Very supportive	Very willing	Increase	Yes lots of cars parked. Less cars at night.	Increase	Sidewalk between bioretention gardens and property line.	1 travel lane with parking on both sides of street.	She likes the idea of the bioretention being a buffer between sidewalk and road; loves the idea of a sidewalk loves that there would be 1 lane of traffic. Has 2 young kids and thinks it would be much safer. She's happy the city would pay for it - she asked if we were asking for donations for the project.
8679600140	LEE MAXINE		11035 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600110	LEIDLE JOHN V		11011 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600030	MANGOURAS PETE+HADLEY		10803 126TH AV NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600160	MARTINEZ DAVID A		10737 126th Ave NE	West	Kirkland WA	98033	Lynn	Door hanger									
8679600290	MARTINEZ FRANCISCA I+MARTIN		11006 126TH AVE NE	East	KIRKLAND WA	98033	Angela	Man who answered door said he did not speak English well and would give to his daughter when she came home									
8679600010	PASUPATHY KARTHIKEYAN+JAYSH		107~~37~~45 126th Ave NE	West	Kirkland WA	98033	Lynn	Door hanger									
8679600320	RAYMOND J MOREAU		12604 NE 109TH PL	East	KIRKLAND WA	98033	Lynn	Door hanger									
8679600300	REV1 HOMES LIMITED		10930 126th Ave NE	East	Kirkland WA	98033	Angela	Door hanger									
8679600130	SAURA JASON M+WHITNEY B		11027 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600060	SCHMITZ DONALD M		10911 126TH ST NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600240	SCHUSTER KAI+JULIE		12607 NE 112TH PL	East	KIRKLAND WA	98033	Lynn	Could not find address									
8679600050	ULLERY NICOLA M+TOM C		10905 126TH AVE NE	West	KIRKLAND WA	98033	Lynn	Door hanger									
8679600280	VARON ALBERT M		11012 126TH AV NE	East	KIRKLAND WA	98033	Angela	Door hanger									
8679600270	WILDMAN GREGORY B		11020 126TH AV NE	East	KIRKLAND WA	98033	Lynn	Door hanger									
8679600370	WILSON LARRY DAVID+MARIA AL		10736 126TH AVE NE	East	KIRKLAND WA	98033	Angela	Door hanger									
8679600070	WOOD ANTHONY R		10919 126TH AV NE	West	KIRKLAND WA	98033	Lynn	Person who answered door said that their dac would need to give feedback, gave survey.									
			10752 126th Ave NE	East	KIRKLAND WA	98033	Angela	Completed survey.	Neutral	Somewhat unsupportive	Somewhat willing	Increase	#1 concern is parking; he uses the parking in front of his house instead of driveway because it slopes; he would not want to have to park across the street; not a lot of traffic on the street so 1 lane should be fine.	I don't know	Sidewalk next to travel lanes.	1 travel lane with parking on both sides of street.	