

City of Lake Forest Park, King County, Washington
Technical Information Report
And Downstream Analysis

For:

Garey Reasonable Use Exception

36xx NE 205th St, Lake Forest Park, WA

APN 4022900497



10/3/2020

Mark X. Plog, P.E.

Revisions:

Date	Description
10/3/2020	Changed to Level Spreader



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Section 1 – Project Overview

The proposed project is to construct one single-family residential structure on an undeveloped lot north of 3611 NE 205th Street in the City of Lake Forest Park (parcel 4022900497). The lot is uncleared with no existing buildings on site. The project site is located in the NE Quarter of Section 33, Township 24N, Range 5 E, King County, Washington and is shown on the vicinity map below.

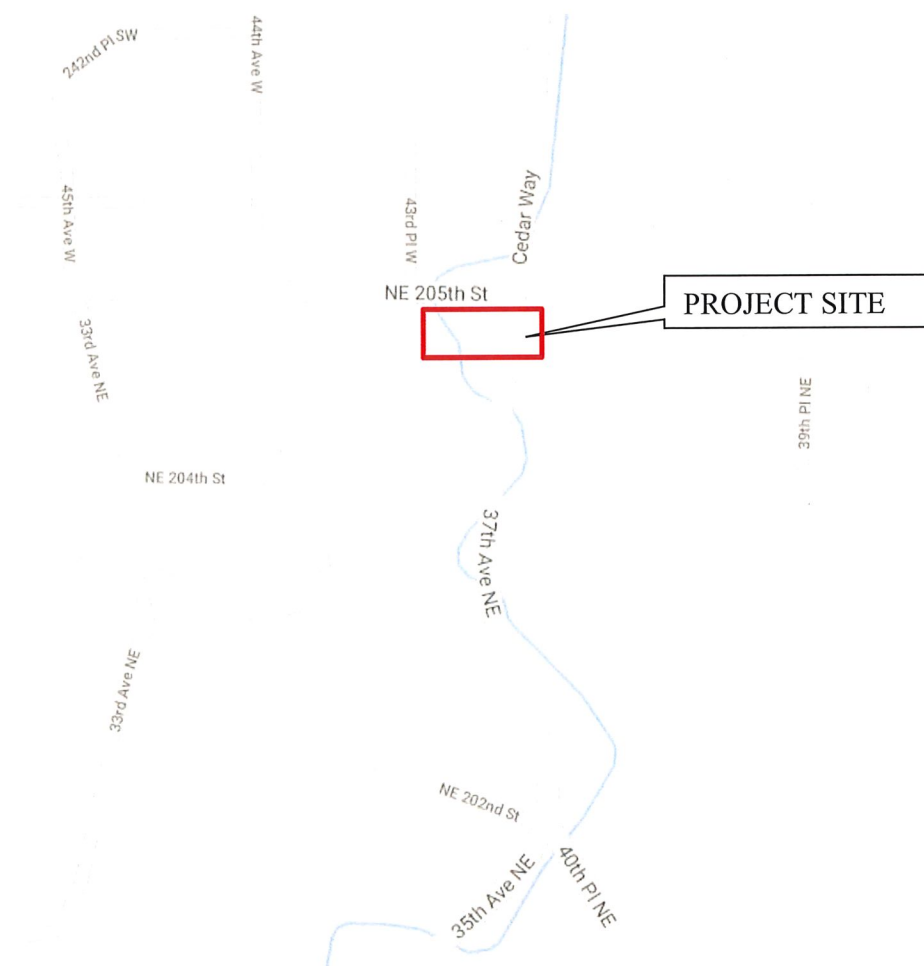


Figure 1 – Vicinity Map

A Reasonable Use Exception is being applied for in order to reduce buffer sizes to allow for a residential structure to be built on-site. There is currently a creek running through the property (see Figure 2).

The soils mapped at the site are Alderwood Complex, 5 to 35% slopes. These soils are moderately well drained and considered SCS Hydrologic Soil Group B soils. These are till soils that exhibit relatively slight surface runoff with significant interflow between the soil surface and underlying glacial till layers. See the soils map below for more information on the site soils.

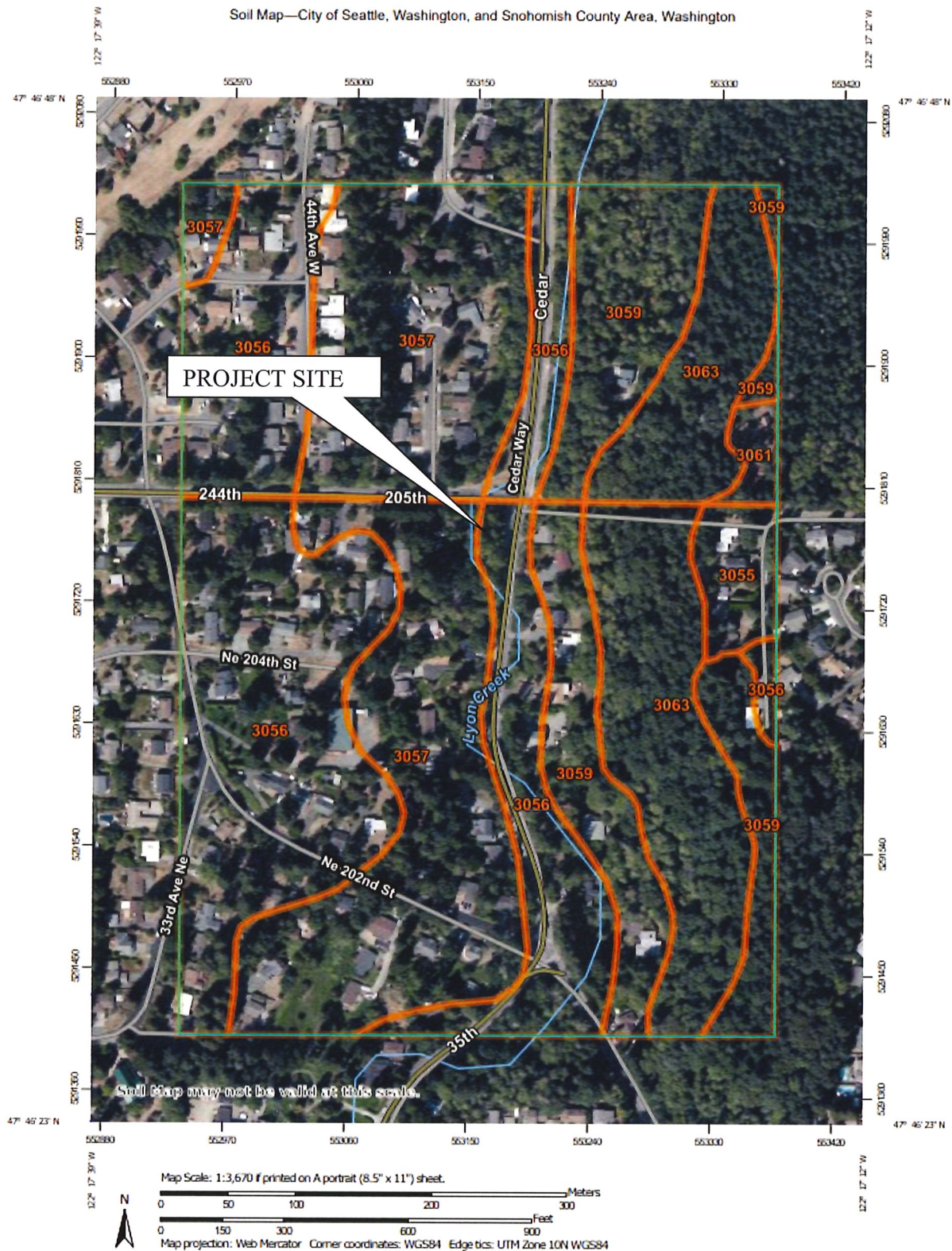


Figure 2 – USGS Soil Map

Section 2 – Conditions and Requirements Summary

The following summary describes how this project will meet the eight “Core Requirements” and the “Special Requirements” that apply:

Core Requirements

1. **Discharge at the natural location:** This site currently discharges to the creek on the property. The natural discharge location will be maintained.
2. **Off-site Analysis:** A Level 1 off-site analysis was completed for this project and is included in Section 3 of this report.
3. **Flow control:** This site is exempt from flow control based on the basic exemption in Section 1.2.3.
4. **Conveyance system:** Dispersion will be utilized; no conveyance system.
5. **Erosion and sedimentation control:** An erosion and sediment control plan has been provided with the submittal.
6. **Maintenance and Operations:** The stormwater facilities for this project shall be maintained in accordance with the requirements of Appendix A of the 2016 KCSWDM.
7. **Financial guarantees and liability:** Financial guarantees and liability will be provided as required by the City of Lake Forest Park.
8. **Water Quality:** This project is exempt from Water Quality requirements.
9. **Flow Control BMP's:** These will be implemented in accordance with KCSWDM Section 1.2.9.3. Specifically, a level spreader is provided.

Special Requirements

1. **Other adopted area-specific requirements:** None
2. **Floodplain/Floodway delineation:** None
3. **Flood protection facilities:** None
4. **Source controls:** None
5. **Oil Control:** None

Section 3 – Off-site Analysis

This Level 1 Downstream Analysis is submitted as required by Core Requirement #2, of the 20016 KCSWDM. Core Requirement #2 requires a qualitative analysis of upstream and downstream drainage conditions with an initial project submittal.

Task 1: Study Area Definition and Maps:

See Section–1 Project Overview of this report for a detailed Study Area Definition.

Task 2: Resource Review:

The King County Sensitive Area Maps, along with the Critical Areas Report from The Watershed Company, show that there is an unclassified creek on the property.

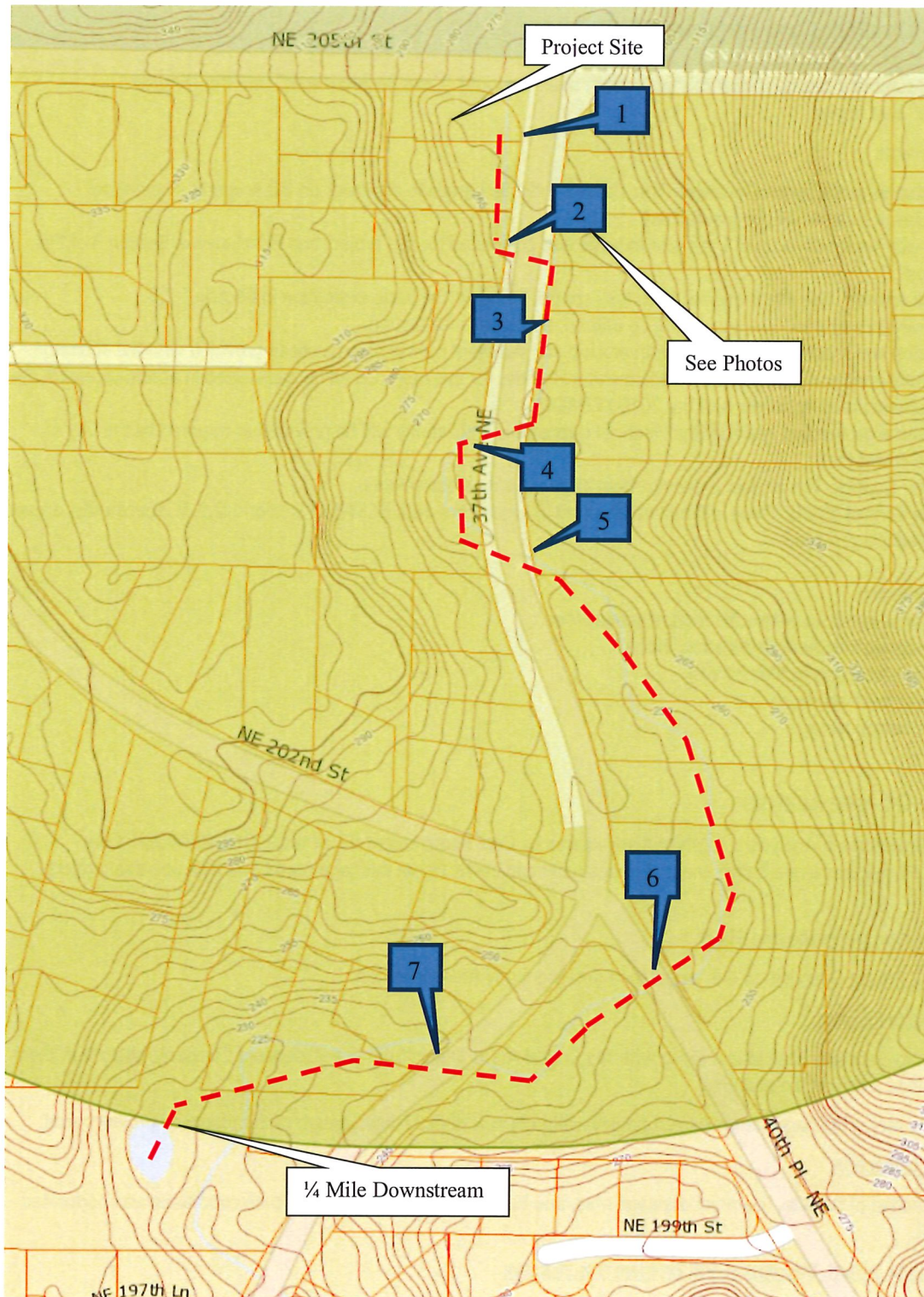
There were no recent drainage complaints on parcels within ¼ mile directly downstream of the proposed project parcel.




Task 3: Field Inspection:




A field observation of the site, upstream drainage area, and ¼ mile downstream drainage path conditions was performed in June, 2018.

Task 4: Drainage System Description and Problem Descriptions:

Upstream: There is not any significant upstream drainage area contributing to the site.



Gary RUE – Lake Forest Park		
Photo#	Description	Photo
1	<p>Sheet flow from property into ravine/stream that exits property on SE corner</p> <p>Potential for erosion due to steep slopes on property</p>	
2	<p>Stream flows under 37th via 2' corrugated metal pipe culvert; lined with rocks and sandbags</p>	
3	<p>Drainage ditch/stream</p> <p>Flows under 2 driveways; 2 2' corrugated metal pipe culverts</p>	

4	Stream crosses W under 37 th 2.5' corrugated metal pipe culvert	
5	Stream crosses E/SE across 37 th 2.5' corrugated metal pipe culvert	
6	Stream crosses under 40 th 2.5' corrugated metal pipe culvert Stream is joined by runoff from 40 th as well as residences uphill	

7	Stream crosses under 37 th 2.5' corrugated metal pipe culvert
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Task 5 – Mitigation of Existing or Potential Problems:

The downstream analysis showed no signs of potential problems. Development mitigation will be outlined in the critical area mitigation plan provided by Altmann Oliver Associates.

Section 4 – Flow Control and Water Quality Facility Analysis and Design

Flow Control

Per the 2016 KCSWDM, this site is exempt from flow control based on the basic exemption in Section 1.2.3. with an increase of less than 0.15 cfs for the 100-year storm. The following calculations were performed to demonstrate the exemption.

Existing undeveloped parcel

Forested area: 0.261 Acres

Proposed parcel

Proposed Home: 1,180 SF (0.027 Acres Impervious)

Pervious Asphalt: 1,014 SF (0.012 Acres Impervious, 0.012 Acres Till Grass)

Lawn: 2,741 SF (0.063 Acres Till Grass)

Forested: 0.147 Acres

Total Impervious: 0.039 Ac

Total Till Grass: 0.075 Ac

Forested: 0.147 Ac

TOTAL: 0.261 Ac

The analysis was completed with WWHM software and the results are as follows:

Existing Condition Analysis

The screenshot displays the WWHM software interface for a 'Basin 1 Predeveloped' analysis. The left sidebar contains a 'SCENARIOS' panel with 'Predeveloped' selected and 'Mitigated' unselected. Below this are sections for 'Run Scenario', 'Basic Elements', 'Pro Elements', 'UID Toolbox', 'Commercial Toolbox', and 'Move Elements'. The main workspace shows a grid with a small green icon representing a building. The right panel displays the following data:

Area in Basin		Available Pervious Acres		Available Impervious Acres	
Available Pervious	Acres	Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Forest, Mod	261				
Pervious Total	0.261 Acres	Impervious Total	0 Acres	Basin Total	0.261 Acres

At the bottom, there is a 'Deselect Zero' button and a 'Select By' dropdown menu set to '60'. The status bar at the very bottom indicates 'Sun 5:51p - 052-18 Garey - Finish Mitigated'.

Flow Frequency

Flow(cfs) 0501 15m

2 Year	=	0.0050
5 Year	=	0.0084
10 Year	=	0.0103
25 Year	=	0.0124
50 Year	=	0.0136
100 Year	=	0.0146

Proposed Condition Analysis

The screenshot shows the 'Basin 1 Mitigated' window in the PLOG Engineering software. The left pane displays a schematic of the basin with a grid and a small icon representing a building. The right pane shows the 'Basin 1 Mitigated' properties, including 'Subbasin Name: Basin 1', 'Designate as Bypass for POC', and 'Flows To: Surface, Interflow, Groundwater'. The 'Area in Basin' section lists 'Available Pervious' and 'Available Impervious' areas in acres. The 'Pervious Total' is 0.222 Acres, 'Impervious Total' is 0.039 Acres, and 'Basin Total' is 0.261 Acres. The 'Select By' dropdown is set to '60'.

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C. Forest, Mod	147	<input checked="" type="checkbox"/> ROOF TOPS/FLAT	039
<input checked="" type="checkbox"/> C. Lawn, Mod	075		

Pervious Total: 0.222 Acres
Impervious Total: 0.039 Acres
Basin Total: 0.261 Acres

Select By: 60

Flow Frequency

Flow(cfs) 0801 15m

2 Year	=	0.0167
5 Year	=	0.0236
10 Year	=	0.0287
25 Year	=	0.0357
50 Year	=	0.0414
100 Year	=	0.0476

The resulting net increase in the 100yr flow from the historical condition to the developed condition is 0.0476 cfs – 0.0146 cfs = 0.033 cfs < 0.15 cfs. Therefore, this project is exempt from the requirements for flow control.

Water Quality

This project proposes less than 5,000 SF of PGIS and is exempt from Water Quality requirements.

Section 5 – Conveyance System Analysis and Design

None

Section 6 – Special Reports and Studies

A wetland and stream report and a mitigation plan has been provided by The Watershed Company. It has been provided as part of this preliminary submittal.

Section 7 – Other Permits

Not analyzed for this preliminary TIR.

Section 8 – ESC Analysis and Design

No analysis required. A TESC plan has been provided.

Section 9 – Bond Quantities, Facility Summaries, and Declaration of Covenant

None required

Section 10 – Operations and Maintenance Manual

None required