DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No. 14-141838-LO and 14-141875-LS

Project Name/Address: Kamoh Residence

Planner: Nick Whipple

Phone Number: 425-452-4578

Minimum Comment Period: November 13, 2014

Materials included in this Notice:

☒ Blue Bulletin
☒ Checklist
☒ Vicinity Map
☒ Plans
☒ Other: Wetland report, project narrative, stream study, critical area study, geotechnical report

OTHERS TO RECEIVE THIS DOCUMENT:
☒ State Department of Fish and Wildlife / Sterwart.Reinbold@dfw.gov; Christa.Heller@dfw.wa.gov;
☒ State Department of Ecology, Shoreline Planner N.W. Region / Jobu461@ecy.wa.gov; sepaunit@ecy.wa.gov
☒ Army Corps of Engineers Susan.M.Powell@nws02.usace.army.mil
☐ Attorney General ecyolyef@atg.wa.gov
☒ Muckleshoot Indian Tribe Karen.Walter@muckleshoot.nsn.us; Fisheries.fileroom@muckleshoot.nsn.us

BACKGROUND INFORMATION

Property Owner: Amrik Kamoh

Proponent: Amrik Kamoh

Contact Person: Carl Hadley, Cedarock Consultants
(If different from the owner. All questions and correspondence will be directed to the individual listed.)

Address: 19609 244th Avenue NE
Woodinville, WA 98077

Phone: (425) 788-0961

Proposal Title: Kamoh Residence Critical Areas Land Use Permit

Proposal Location: 439 West Lake Sammamish Parkway SE
(Street address and nearest cross street or intersection) Provide a legal description if available.
362505-9169 (see Vicinity Map for legal description).
Please attach an 8 ½" x 11" vicinity map that accurately locates the proposal site.

Give an accurate, brief description of the proposal's scope and nature:

1. General description: Construct single-family residence within a maximum 3,000 sq.ft. area on a 56,772 sq.ft. lot. Site is >99% encumbered. Development will require a reasonable use exception.
2. Acreage of site: 1.30
3. Number of dwelling units/buildings to be demolished: 0
4. Number of dwelling units/buildings to be constructed: 1
5. Square footage of buildings to be demolished: N/A
6. Square footage of buildings to be constructed: Unknown at this time
7. Quantity of earth movement (in cubic yards): <100
8. Proposed land use: Single-family residential
9. Design features, including building height, number of stories and proposed exterior materials:
   Garage and multi-story house to be designed after land-use approval.
10. Other
    Maximum permanent disturbance less than 3,000 square feet. Maximum temporary disturbance less than 3,700 square feet.

Estimated date of completion of the proposal or timing of phasing:

Construction scheduled for spring-summer 2016. No phasing is required.

Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No.

List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Critical Areas Report prepared by Cedarock Consultants, Inc. dated July 2007, with September 2014 update. Wetland and Wildlife Report by Resource Analysis and Management dated October 2006, with September 2014 update. Geotechnical Report by Associated Earth Sciences, Inc dated August 2006, with September 2014 update.

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. List dates applied for and file numbers, if known.

None known.

List any government approvals or permits that will be needed for your proposal, if known. If permits have been applied for, list application date and file numbers, if known.

Critical Areas Land Use Permit (Reasonable Use)
Building Permit
Utility Connection Permits

Please provide one or more of the following exhibits, if applicable to your proposal.
(Please check appropriate box(es) for exhibits submitted with your proposal):

☐ Land Use Reclassification (rezone) Map of existing and proposed zoning

☐ Preliminary Plat or Planned Unit Development
Preliminary plat map

☐ Clearing & Grading Permit
Plan of existing and proposed grading
Development plans

☐ Building Permit (or Design Review)
Site plan
Clearing & grading plan

☐ Shoreline Management Permit
Site plan

A. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site: ☐ Flat ☐ Rolling ☐ Hilly ☑ Steep slopes ☐ Mountains ☐ Other

b. What is the steepest slope on the site (approximate percent slope)? >40%

c. What general types of soil are found on the site (for example, clay, sand, gravel, peat, and muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Alderwood gravelly sandy loam (AgC) per NRCS mapping.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

None known (see AESI 2006).

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Excavation of less than 100 cubic yards will be conducted to create buildable area on the slopes. No fill is proposed.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion is possible during construction due to exposed soils.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Impervious surface will not exceed that allowed under City codes (a maximum of 3,000 sq.ft. or 5.5% of site).

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Clearing and Grading and Construction BMPs will be incorporated into the final project design. All areas of temporary disturbance will be re-vegetated as will be identified in the site restoration plan. Permanent disturbance will be limited to no greater than 3,000 sq.ft. Site inspection will be conducted by City clearing and grading inspectors.

2. AIR

a. What types of emissions to the air would result from the proposal (i.e. dust, automobile odors, and industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Construction dust will be controlled as part of construction BMPs. Emissions from autos and trucks are regulated by state and federal agencies.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None known.

c. Proposed measures to reduce or control emissions or other impacts to the air, if any:

Construction dust will be controlled as part of construction BMPs. Emissions from autos and trucks are regulated by state and federal agencies.

3. WATER

a. Surface

(1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

A Type N stream was identified crossing the property (Cedarock 2014, City of Bellevue Stream Typing Inventory Reach No 90-22). The stream is a tributary to Lake Sammamish. Two category IV wetlands are also found on the site (RAM 2014).

(2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If Yes, please describe and attach available plans.

Yes, clearing, grading, and construction will occur within 200-feet of the stream and wetlands. No direct disturbance is proposed.

(3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None.

(4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

(5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No. (reference: City of Bellevue GIS floodplain data).

(6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground

(1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description.

No.

(2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.) Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None.

c. Water Runoff (Including storm water)

(1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Stormwater from the site will minimized by maintainng approximately 94.5 percent of the lot as pervious soil. Runoff from new impervious surface will be routed to the existing storm drain system along W. Lk. Sammamish Parkway.

(2) Could waste materials enter ground or surface waters? If so, generally describe.

Yes. The steep site drains toward the Type N stream which is relatively close to the proposed construction disturbance.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Construction is proposed for the summer dry season. Site disturbance will be minimized. Stormwater runoff will be controlled with construction BMPs to be developed based on site-specific recommendations from the geotechnical engineers and the City of Bellevue Clearing and Grading Department, and the Utilities Departments upon development of the final site plan.

4. Plants

a. Check or circle types of vegetation found on the site:

- ☑ deciduous tree: alder, maple, aspen, other
- ☑ evergreen tree: fir, cedar, pine, other
- ☑ shrubs
- ☑ grass
- ☐ pasture
- ☐ crop or grain
- ☑ wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
- ☐ water plants: water lily, eelgrass, milfoil, other
- ☐ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Native and non-native shrubs and forbs will be cleared from less than 3,700 sq.ft. of the site. Tree clearing will be minimized with an expected removal of only about 6 trees >6" DBH.

c. List threatened or endangered species known to be on or near the site.

None known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native plants will be used to revegetate all areas of temporary disturbance including the riparian buffer adjacent to the Type N stream. Landscaping will also consist of predominantly native vegetation.

5. ANIMALS

a. Check or circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

- ☑ Birds: hawk, heron, eagle, songbirds, other: crows, ravens, pigeons, doves, owls, woodpeckers.
- ☑ Mammals: deer, bear, elk, beaver, other: chipmunks, squirrels, rabbits, raccoons, coyotes.
- ☐ Fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

None known.

c. Is the site part of a migration route? If so, explain.

None known.

d. Proposed measures to preserve or enhance wildlife, if any:

94 percent of the site will be left untouched including the more heavily forested upper part.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy need? Describe whether it will be used for heating, manufacturing, etc.

Electricity and natural gas

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of the proposal? List other proposed measures to reduce or control energy impacts, if any:

Standard UBC requirements.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

None known.

(1) Describe special emergency services that might be required.

None expected

(2) Proposed measures to reduce or control environmental health hazards, if any.

Standard construction BMPs.

b. Noise

(1) What types of noise exist in the area which may affect your project (for example, traffic, equipment, operation, other)?

Traffic.

(2) What types and levels of noise would be created by or associated with the project on a short-term or long-term basis (for example, traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Standard traffic and construction noise associated with development of a single family home. No long unusual term noises would be created.

(3) Proposed measures to reduce or control noise impacts, if any:

Standard City of Bellevue noise regulations will be observed.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

The site and all adjacent properties are either undeveloped or contain single-family residences.

b. Has the site been used for agriculture? If so, describe.

No.

c. Describe any structures on the site.

None.

d. Will any structures be demolished? If so, what?

No.

e. What is the current zoning classification of the site?

R.1.8

f. What is the current comprehensive plan designation of the site?

Single-Family Low

g. If applicable, what is the current shoreline master program designation of the site?

N/A

h. Has any part of the site been classified as an “environmentally sensitive” area? If so, specify.

Yes. Type N stream, two Cat. IV wetlands, steep slopes.

I. Approximately how many people would reside or work in the completed project?

One single family residence.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A

i. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Compliance with City of Bellevue codes.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

1 moderate/high income residence

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

None.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Building will not exceed allowable maximum building height. The house has not yet been designed.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

None.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Standard porch, driveway, landscaping, and security lighting may be used as allowed by code.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None known,

d. Proposed measures to reduce or control light or glare impacts, if any:

None.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Two city parks (Weowna and Lake Hills Community)

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

None known.

b. Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site.

None known.

c. Proposed measures to reduce or control impacts, if any:

None.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

West Lake Sammamish Parkway will be accessed with a driveway.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Public busses currently run along West Lake Sammamish Parkway with the nearest stop approximately 1/3 mile away.

c. How many parking spaces would be completed project have? How many would the project eliminate?

3-4 parking places will be provided. None will be eliminated.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

2 to 4.

g. Proposed measures to reduce or control transportation impacts, if any:

None.

15. Public Services

a. Would the project result in an increased need for the public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

Increase as needed to provide service for one single-family residence.

b. Proposed measures to reduce or control direct impacts on public services, if any:

None.

16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

Electricity, refuse, telephone, sanitary sewer.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

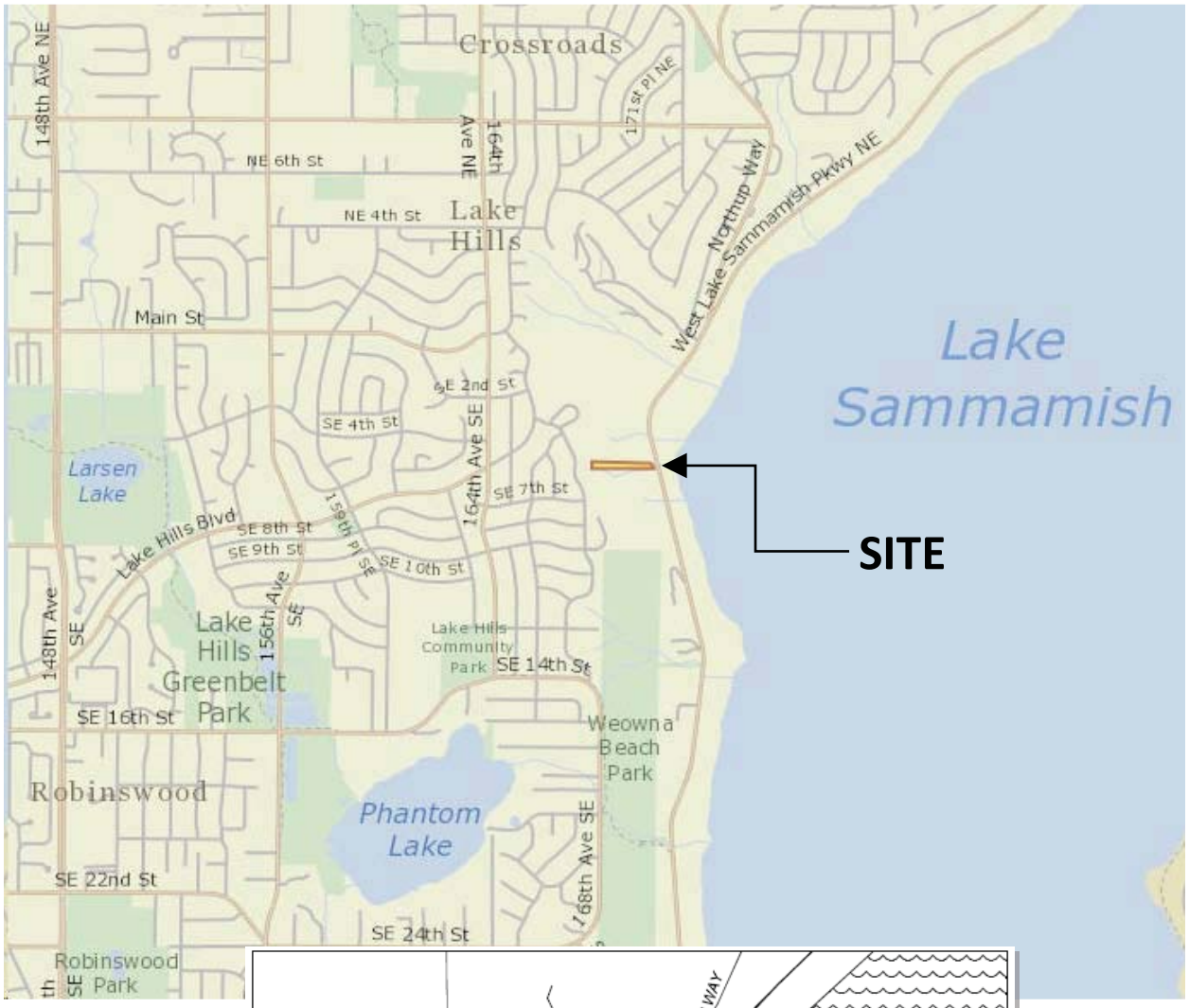
Electricity, refuse, telephone, sanitary sewer, and stormwater

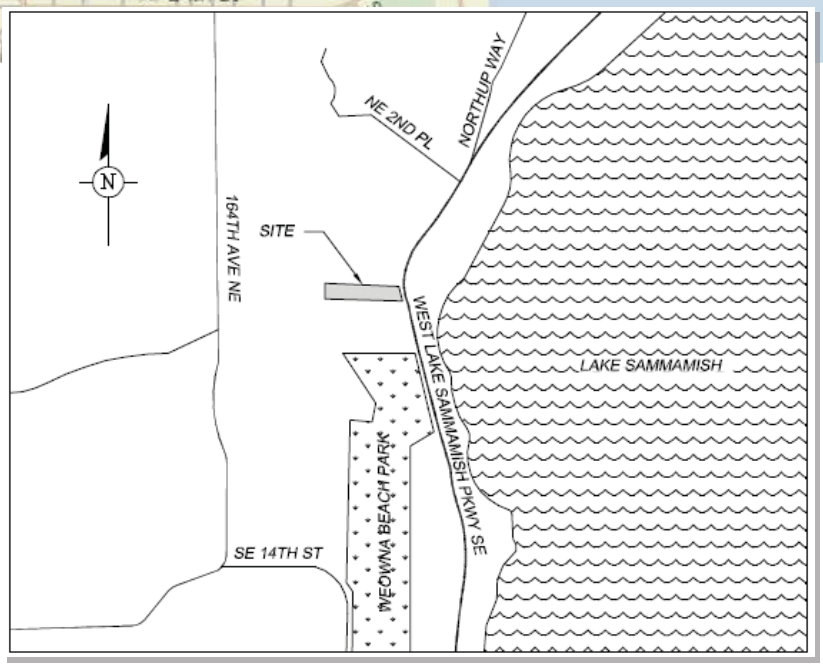
Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature.....  .....Date Submitted.....09/23/2014.....

Proposed Kamoh Single Family Residence
439 West Lake Sammamish Parkway SE
POR OF FOLG DESC LY WLY OF CO RD - S 75 FT OF N 335.7 FT OF GL 4 IN SEC 36-25-5





Kamoh Vicinity Map

0 193 385

Scale 1: 2,312 Feet

Map Generated on: 10/20/2014

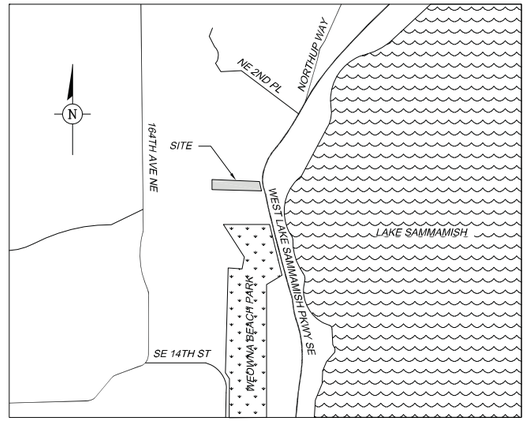
SW 1/4, SEC.36, TWN.25N, RGE. 5E, W.M.

CRITICAL AREAS EXHIBIT

KAMOH RESIDENCE

439 West Lake Sammamish Parkway SE

GRAPHIC SCALE
30 0 15 30
SCALE IN FEET



CONCEPTUAL HOUSE LAYOUT
FINAL HOUSE DESIGN WILL NOT EXCEED BOUNDS SHOWN HERE

LIMITS OF STEEP SLOPE

50' STREAM BUFFER MEASURED FROM TOP OF BANK

DEVELOPABLE AREA (TYP.)

50' STREAM BUFFER PROJECTED FROM SURVEY DATA

LIMITS OF STEEP SLOPE

50' STREAM BUFFER MEASURED FROM TOP OF BANK

NO STREAM SURVEY DATA AVAILBLE FOR THIS AREA

WETLAND BOUNDARIES

APPROX. LOCATION TOP OF BANK *

APPROX. LOCATION OF CREEK CHANNEL

WEST LAKE SAMMAMISH PARKWAY SOUTHEAST

* TOP OF BANK IS SHOWN AS AGREED BY THE CITY OF BELLEVUE DUE TO AN OVERSIGHT IN THE CRITICAL AREAS ORDINANCE.

SUMMARY TABLE	TOTAL SITE AREA	
	FT²	AS % OF TOTAL SITE
TOTAL CRITICAL AREAS	56,556 SF	99.62 %
NON-CRITICAL AREA / DEVELOPABLE AREA (NON-SHADED)	216 SF	0.38 %
TOTAL SITE AREA	56,772 SF	———

CRITICAL AREA (STEEP SLOPE, STREAM, STREAM BUFFER, AND/OR WETLAND

Resource Analysis *and* Management

12207 SE 12th Street Bellevue, WA 98005
(425) 649-9416 (425) 466-5202
neimanken@comcast.net

September 14, 2014

Mr. Carl Hadley
Cedarock Consultants, Inc.
19609 244th Avenue NE
Woodinville, WA 98077

Re: Review of Critical Areas Evaluation - Tax Parcel #3625059169, City of Bellevue

Dear Mr Hadley:

This letter is to document my review of materials and site visit of a critical areas evaluation for a proposed residential building project in the City of Bellevue, Washington that was originally conducted in October, 2006. The project site is identified as Tax Parcel # 3625059169. The original site investigation found two Class 4 wetlands and no Critical Wildlife Habitat per City of Bellevue Critical Areas Ordinance, Chapter 20.25H.

I revisited this site on September 12, 2014, eight years after the original investigation and report were produced. The changes I found are discussed in the following paragraphs.

The small (400 square-foot) wetland is no longer there. The area it had occupied still has hydric soil characteristics, but the vegetation species composition and hydrology have changed to upland conditions. This area does not classify as a wetland. For identification purposes I identified the center of this area with one pink flag. In the vicinity of this area there are now at least two large storm water drainage pipes from adjacent upslope properties that are conveying water directly to the stream. This may or may not account for the change in hydrology and subsequent loss of wetland vegetation species.

The second, larger wetland delineated in 2006 is unchanged in size and location. Some of the original flagging was still present. I reflagged the wetland boundary with pink flagging. There seems to be more free flowing water coming from the seep area that creates this wetland than was present originally. Otherwise, it is still a Class 4 wetland, less than 2500 square feet in area and does not require a vegetation buffer zone or structure setback.

The wildlife habitat component of the original report remains relatively unchanged. I found no sign (tracks, browsing, scat,...) of large mammal activity on the property. There was no fresh sign of pileated woodpecker foraging as originally observed. No raptor nesting was found, but this would

require site visits during breeding season to be a thoroughly positive observation. Due to the proximity of dense residential housing, little to no raptor use other than perching/resting would be expected on the property.

As found in the original report, the residential construction project as proposed in plans provided to me will not impact either the remaining wetland and its associated buffers or potential critical wildlife habitat on or near the subject property.

Thank you for the opportunity to assist you with this project. If there are additional requests from the City of Bellevue relative to this letter, please let me know and I will try to satisfy their needs.

Sincerely,

Kenneth E. Neiman, Ph.D.
Certified Senior Ecologist

RESOURCE ANALYSIS *and* MANAGEMENT

12207 SE 12th Street ▪ Bellevue, WA 98005 ▪ (425) 649-9416
E-mail: kneiman@attglobal.net

October 23, 2006

Mrs. Heather Washburn
240 W. Lake Sammamish Parkway SE
Bellevue, WA 98008

Re: Critical Areas Evaluation - Tax Parcel #3625059169, City of Bellevue

Dear Mrs. Washburn:

I conducted a critical areas evaluation for a proposed residential building project in the City of Bellevue, Washington. The property along the west side of W. Lake Sammamish Parkway SE is identified as Tax Parcel #3625059169. The project site covers approximately 1.27 acres of undeveloped land. There is a concern that some parts of the property may support wetlands or wildlife habitat that is regulated under the City of Bellevue Critical Areas Ordinance, Chapter 20.25H.

I conducted a search of the National Wetlands Inventory, the King County Sensitive Areas Map Folio, Soil Conservation Service maps and other available existing data sources. None of the regulatory agency data bases showed wetlands or wildlife habitat conservation areas on the site. The King County iMaps data base shows a small unnamed stream running through the property.

The City of Bellevue requires that site specific wetland investigations be conducted using methods outlined in *Washington State Wetland Identification and Delineation Manual (Ecology #96-94)*. Identified wetlands will be given a qualitative rating based on *Washington State Wetland Rating System for Western Washington (Ecology Pub. #04-06-025)*. Sensitive areas boundaries that may be on properties adjacent to proposed upland impact zones must also be considered as potential impact areas.

I visited the site on October 18, 2006 and performed a wetland determination and search for regulated wildlife habitat for areas that are on or contiguous with the proposed activities. It must be noted that conditions this spring and summer were drier than normal following a winter of much higher than average precipitation. Two wetlands were observed, flagged and are discussed below. (Please see attached Parcel Map for approximate locations). The wildlife survey for sensitive species and their habitat is also discussed at the end of this report.

The first site that presents wetland characteristics on the subject property is located about 250 feet to the west of the east property line along W. Lake Sammamish Parkway. This wetland is a sloping wetland created by water seeping from underground sources. It is a small wetland, less than 400 square feet in area, predominated by a Scrub/Shrub wetland vegetation class. The dominant vegetation is thimbleberry with a few scattered lady-fern plants. The soils are saturated

and have hydric soil characteristics, but do not fit SCS Soil Series descriptions well. The adjacent upland habitat is conifer/deciduous forest, having very well-drained Alderwood Series soils. This site classifies as a Category IV wetland (see attached Wetland Rating Forms which apply to both wetlands). As a Category IV wetland less than 2,500 square feet in area, it does not require a vegetation buffer zone or a structure setback.

The second wet site encountered is a larger wetland located about 75 feet to the west and upslope of the first wetland. The two wetlands are not hydrologically connected and are therefore distinct entities. This wetland is also a sloping wetland created by water seeping from underground sources. It is a somewhat larger wetland, approximately 2,200 square feet in area, predominated by a Scrub/Shrub wetland vegetation class. The dominant vegetation at this site is also thimbleberry with a few scattered lady-fern plants. The soils are saturated and have hydric soil characteristics, but do not fit SCS Soil Series descriptions well. The adjacent upland habitat is conifer/deciduous forest, having well-drained Alderwood Series soils. This site classifies as a Category IV wetland (see attached Wetland Rating Forms which apply to both wetlands). As a Category IV wetland less than 2,500 square feet in area, it does not require a vegetation buffer zone or a structure setback.

There are no known Wildlife Habitat Conservation Areas on or immediately adjacent to this property. This site is surrounded by land mostly developed as high-density single-unit residential housing. Although suitable wildlife habitat for terrestrial and avian species is found on this and adjacent property, it provides no corridor to or from adjacent tracts of much larger (250 acres or larger) habitats. Species that may be expected to be found intermittently on this site are: deer, bear, coyote, mountain beavers, eastern grey squirrels, other assorted rodent species, raptors, woodpeckers, and song birds. Although there are several large conifer trees suitable for red-tailed hawk or owl nesting within the steep slope portion of the property, no nesting activity by these species is occurring nor is it known to have occurred in the recent past. Large trees in the area undoubtedly provide short-term perching sites for bald eagles, but none of these are known to be critical nesting or roosting habitat sites. Pileated woodpecker foraging activity was observed on scattered dead tree trunks, but there are no suitable sites for pileated woodpecker nesting in the area. No other species listed by the US Fish and Wildlife Service, Washington Department of Fish and Wildlife, King County or City of Bellevue as threatened, endangered, sensitive or candidate are expected to utilize habitats found on this property.

Since your construction project as planned will not impact either wetland or associated buffer, this letter should be sufficient documentation for Critical Area review of the site. Thank you for the opportunity to assist you with this project. If there are additional requests from the City of Bellevue relative to this letter, please let me know and I will try to satisfy their needs.

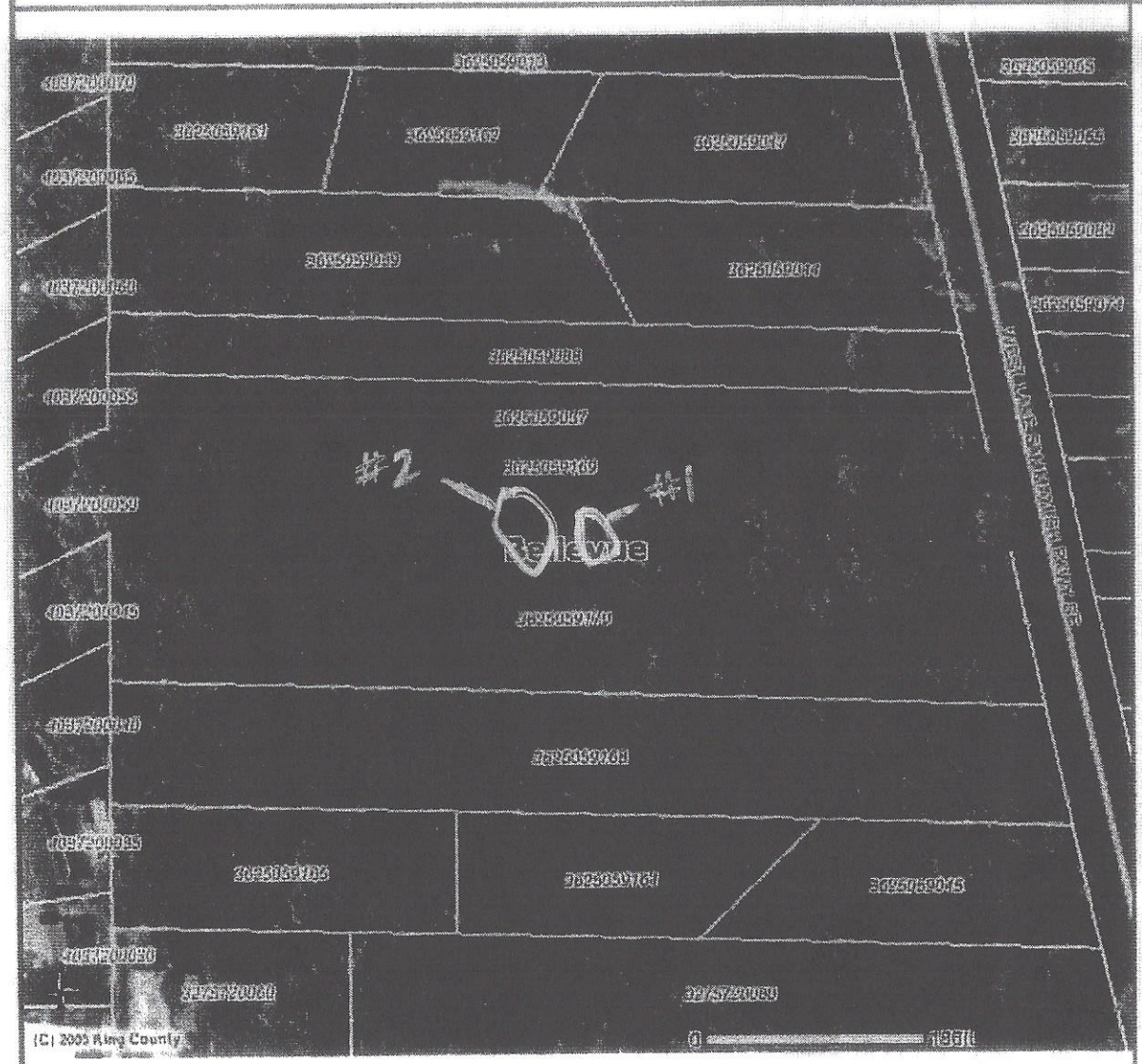
Sincerely,

Kenneth E. Neiman

Kenneth E. Neiman, Ph.D.
Certified Senior Ecologist

King County

Parcel 3625059169 Wetlands



Legend

- Selected Parcels
- County Boundary
- Mountain Peaks
- Highways
- Forest Production District Boundary
- Agricultural Production District Boundary
- Urban Growth Area Line
- Incorporated Area
- Streets
- Highway
- Avenue
- Local
- Lakes and Large Rivers
- Streams
- Tribal Lands
- Parcels
- Parks
- Unincorporated KC Zoning
- A-10 Agricultural one DU per 10 acres
- A-35 Agricultural one DU per 35 acres
- F Forest
- M Mineral
- RA-2.5 Rural Area one DU per 2.5 acres
- RA-5 Rural Area one DU per 5 acres
- RA-10 Rural Area one DU per 10 acres
- UR Urban Reserve one DU per 5 acres
- R-1 Residential one DU per acre
- (cont)
- R-4 Residential 4 DU per
- R-6 Residential 6 DU per
- R-8 Residential 8 DU per
- R-12 Residential 12 DU p
- R-18 Residential 18 DU p
- R-24 Residential 24 DU p
- R-48 Residential 48 DU p
- NB Neighborhood Busines
- CB Community Business
- RB Regional Business
- O Office
- I Industrial
- Other
- 2002 Color Aerial Pl

Wetlands #1 + #2

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, expres implied, as to accuracy, completeness, timeliness, or rights to the use of such information. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, b

DRAFT WETLAND RATING FORM – WESTERN WASHINGTON

Name of wetland (if known): [redacted] Unnamed site

Location: SEC: 36 TWNSHP: 25 N RNGE: 5E (attach map with outline of wetland to rating form)

Person(s) Rating Wetland: K. Neiman Affiliation: RAM Date of site visit: 10/18/2006

DRAFT SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ (IV X)

Category I = Score >70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	0
Score for Hydrologic Functions	3
Score for Habitat Functions	19
TOTAL score for functions	

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ **Does not Apply** X

Final Category (choose the "highest" category from above) 22

Check the appropriate type and class of wetland being rated.

Wetland Type		Wetland Class	
Estuarine		Depressional	
Natural Heritage Wetland		Riverine	
Bog		Lake-fringe	
Mature Forest		Slope	X
Old Growth Forest		Flats	
Coastal Lagoon		Freshwater Tidal	
Interdunal			
None of the above			

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland been documented as a habitat for any Federally listed Threatened or Endangered plant or animal species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland been documented as habitat for any State listed Threatened or Endangered plant or animal species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database.		X
SP3. *Does the wetland contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	
S	**S 1. Does the wetland have the potential to improve water quality? *(see p. 64)***	
S	S 1.1 Characteristics of average slope of wetland: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* ..... points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0 measured using clinometer	0
S	S 1.2 The soil 2 inches below the surface is clay, organic, or smells anoxic (hydrogen sulfide or rotten eggs). YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface.* Dense, ungrazed, herbaceous vegetation > 90% of the wetland area points = 6 Dense, ungrazed, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, ungrazed, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0	0
S	**Total for S 1** *Add the points in the boxes above*	0
S	**S 2. Does the wetland have the opportunity to improve water quality? *(see p. 67)*** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other_____ **YES** multiplier is 2 **NO** multiplier is 1	multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 *Add score to table on p. 1*	0

Comments

	S Slope Wetlands	Points
	HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	
	S 3. Does the wetland have the potential to reduce flooding and stream erosion? *(see p. 68)*	
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland.* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows) points = 6 ~~Dense, uncut, **rigid** vegetation > 1/2 area of wetland~~ points = 3 Dense, uncut, **rigid** vegetation > 1/4 area Maybe points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	1
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 / NO points = 0	2
S	*Add the points in the boxes above*	3
S	**S 4. Does the wetland have the opportunity to reduce flooding and erosion?** *(see p. 70)* Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other_____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream ~~side of a dam~~)* **YES** multiplier is 2 **NO** multiplier is 1	multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 *Add score to table on p. 1*	3

Comments

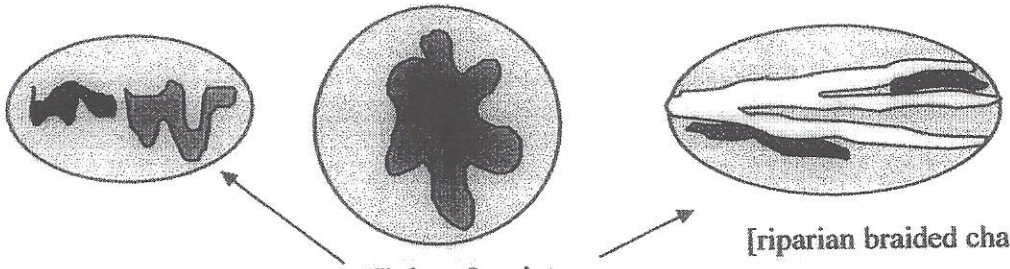
These wetlands do provide some velocity reduction, but the stream they eventually flow into does not have downstream flooding problems.

These questions apply to wetlands of all HGM classes.	**Points**
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	
H 1. Does the wetland have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin) if the class covers more than 10% of the area of the wetland or ¼ acre.* ____Aquatic bed ____Emergent plants __X__Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) ____Forested areas have 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) *Add the number of vegetation types that qualify. If you have:* 4 types or more — points = 4 3 types — points = 2 2 types — points = 1 (1 type) — points = 0	0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated __X__Seasonally flooded or inundated ____Occasionally flooded or inundated __X__Saturated only ____Permanently flowing stream or river in, or adjacent to, the wetland __X__Seasonally flowing stream in, or adjacent to, the wetland ____***Lake-fringe wetland*** **= 2 points** ____***Freshwater tidal wetland*** **= 2 points** 4 or more types present — points = 3 (3 types present) — points = 2 2 types present — point = 1	2
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species — points = 2 5 - 19 species — points = 1 (< 5 species) — points = 0 *List species below if you want to:* thimbleberry lady-fern sword-fern	0

H 1.4. Interspersion of habitats *(see p. 76)*

Decided from the diagrams below whether interspersion between types of vegetation (described in H 1.1), or vegetation types and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.

None = 0 points Low = 1 point Moderate = 2 points



[riparian braided channels]

High = 3 points

NOTE: If you have four or more vegetation types or three vegetation types and open water the rating is always "high".

1

H 1.5. Special Habitat Features: *(see p. 77)*

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

- [X] Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- [ ] Standing snags (diameter at the bottom > 4 inches) in the wetland
- [ ] Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream for at least 33 ft (10m)
- [ ] Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present
- [ ] At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. *(structures for egg-laying by amphibians)*
- [X] Invasive plants cover less than 25% of the wetland area in each stratum of plants

1

H 1. TOTAL Score - potential for providing habitat
Add the scores in the column above

5

Comments

H 2. Does the wetland have the opportunity to provide habitat for many species?

H 2.1 Buffers *(see p. 80)*

Choose the description that best represents condition of buffer of wetland. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."

— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No developed areas within undisturbed part of buffer. **(relatively undisturbed also means no-grazing)** **Points = 5**

— 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4**

X 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, ~~or open water~~ >95% circumference. **Points = 4**

— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3**

— 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3**

If buffer does not meet any of the three criteria above

— No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**

— No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**

— Heavy grazing in buffer. **Points = 1**

— Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.**

— Buffer does not meet any of the criteria above. **Points = 1**

4

H 2.2 Corridors and Connections *(see p. 81)*

H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). the forested area from N Main St. south to SE 24th St. is less than 200 acres in size

YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2

H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above?

YES = **2 points** (*go to H 2.3*) NO = H 2.2.3

2

H 2.2.3 ~~Is the wetland:~~

within 5 mi (8km) of a brackish or salt water estuary OR
within 3 mi of a large field or pasture (>40 acres) OR
within 1 mi of a lake greater than 20 acres?

YES = **1 point** NO = **0 points**

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)*

Which of the following priority habitats are within 330ft (100m) of the wetland?
(see text for a more detailed description of these priority habitats)

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

____ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.

____ **Old-growth forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age.

X **Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

____ **Prairies:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

____ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages

____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

____ **Urban Natural Open Space**: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

____ **Estuary/Estuary-like:** Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5% during the period of average annual low flow. Includes both estuaries and lagoons.

____ **Marine/Estuarine Shorelines**: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

~~If wetland has 3 or more priority habitats = 4 points~~

If wetland has 2 priority habitats = **3 points**

~~If wetland has 1 priority habitat = 1 point~~ No habitats = 0 points

3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)***	
There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, ~~fill, fields,~~ or other development. points = 5	
The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5	
There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3	
The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3	5
There is at least 1 wetland within ½ mile. points = 2	
There are no wetlands within ½ mile. points = 0	
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	14
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	19

CEDAROCK CONSULTANTS, INC.

LAND USE PERMIT
APPLICATION COVER LETTER AND VARIANCE REQUEST

Date: September 23, 2014

Subject: Kamoh Single Family Residence
439 West Lake Sammamish Parkway SE
Land Use Application with SEPA and Variance

Enclosed please find application for a Critical Areas Land Use Permit for a single-family residence on a property that is more than 99 percent encumbered by critical areas. The application requests a variance under the reasonable use provisions of the City of Bellevue Land Use Code.

A new owner of the above-referenced property is resubmitting a land use application that was previously approved by the City of Bellevue in 2007 (File Number 07-112007-LO; Heather Washburn proponent).

The new application is virtually identical with respect to proposed land disturbance. The location, size, and footprint of proposed temporary and permanent disturbances will be equal to or smaller than the previously approved submittal. The proposed house design will change, but the footprint will be within the proposed footprint of the previous design. The footprint will not exceed 3,000 square feet. The house design process will proceed upon issuance of the new land use approval. A final critical areas mitigation/enhancement plan equivalent to the previous submittal will be provided at that time as allowed under LUC 20.25H.220.A. Certain submittal requirements cannot be met until the house is designed (e.g. Site Plan B, complete Statistical Information relevant to the house size and design,

A Critical Areas Report, Stream Report, Wetland Report, and Preliminary Geotechnical Analysis of the site were completed for the previous application. The original authors of these reports re-visited the site in September 2014 and verified all previously described conditions and recommendations contained within the earlier reports are still valid. The only minor exception is a required change in the structural design guideline recommendations in the Geotech report due to adoption by the City of Bellevue of the 2012 IBC standards that replace the previously recommended 2003 standards. The original reports and more recent updates are provided with this application.

The applicant requests that the City of Bellevue reprocess and reissue the Residential Land Use Permit for the site. There have been no changes to site conditions or to the relevant portions of the Land Use Code in the interim so we hope this process can be completed with minimal delay.

Narrative Addressing Variance Criteria

The subject lot is almost completely encumbered with a Type N stream, two category IV wetlands, steep slope hazards, and their buffers. Variance from standard critical areas code and lot coverage requirements is needed under a reasonable use exception (LUC 20.25H.200). The following variances are requested:

1. Minimum available development area: The site contains approximately 216 sq.ft. of land not encumbered with critical areas. The site is considered to have no reasonable use under the regulations if developable area is less than 3,000 sq.ft. (LUC 20.25H.200.A.2.b.i).
2. Maximum Lot Coverage: Lot coverage calculated after subtracting all critical areas and stream critical area buffers from total lot size exceeds the 35 percent allowed under LUC 20.20.010.

In both cases, the applicant requests development of a portion of the site to accommodate a maximum of 3,000 sq.ft. of permanent impact area. Temporary and permanent impacts will affect only steep slopes and the riparian buffer. No direct impacts to the wetlands, wetland buffers, or stream channel are proposed. Performance standards required under LUC 20.25H.205 will be met.

LUC 20.30G.140.A and LUC 20.30G.140.B provide decision criteria that must be met before the Director may approve or approve with modifications an application for a variance from the provisions of the Land Use Code. These criteria are discussed below:

A.1. The variance will not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and land use district of the subject property; and

The applicant is requesting development of one relatively moderately-sized home that is entirely consistent with the home sizes and uses enjoyed on other lots in this neighborhood.

A.2. The variance is necessary because of special circumstances relating to the size, shape, topography, location or surroundings of the subject property to provide it with use rights and privileges permitted to other properties in the vicinity and in the land use district of the subject property; and

The subject property contains only about 216 sq.ft. of land not encumbered with critical areas. These are special circumstances related to the site that would deny the owners the privilege of having a home consistent with how other lots in the neighborhood are used without obtaining a variance.

A.3. The granting of the variance will not be materially detrimental to property or improvements in the immediate vicinity of the subject property; and

The site has been evaluated by biologists and geotechnical engineers. Site-specific recommendations have been made for developing the site in order to avoid and minimize potential detrimental impacts to the natural and physical environment on and in the immediate vicinity of the site. These recommendations are contained in individual reports, and summarized in a Critical Areas Report included with this application.

A.4. The variance is not inconsistent with the Comprehensive Plan; and

The variances will allow development of a single-family residence on a lot zoned R-1.8. This is consistent with the Comprehensive Plan recommendations for this area.

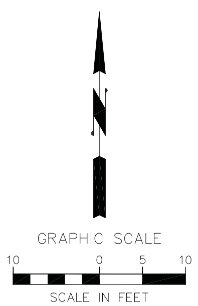
B.1. A variance to the requirements of Part 20.25H LUC may be granted only if the applicant demonstrates that a variance from other provisions of the LUC, where allowed under this part or Part 20.30H LUC, is not feasible. For purposes of this section, variances from the other provisions of the LUC shall be considered not feasible only when, considering the function to be served by the proposal, a variance to other provisions of the LUC, including non-critical area setbacks, will not realize the intended function of the proposal; and

Because the site with the exception of 216 sq.ft. is entirely encumbered with critical areas that extend off-site in all directions, the variances requested here are necessary to allow the applicant to develop even the minimum size structure allowed under LUC 20.25H. There is no piece of the property that would be suitable for development under any other variances other than those requested here. The applicants have requested to develop the piece of property closest to West Lake Sammamish Parkway, and furthest from the steepest slopes wetlands, and intact wildlife habitat.

B.2. Where the variance involves disturbance of a critical area or critical area buffer, the variance includes a mitigation plan meeting the requirements of LUC 20.25H.210.

Per LUC 20.25H.220.A, this application includes a conceptual critical area mitigation plan as part of the Critical Areas Report. A final detailed critical areas mitigation/enhancement plan will be provided with the building plans to be submitted later.

SW 1/4, SEC.36, TWN.25N, RGE. 5E, W.M.



TOTAL SITE AREA:

56,772 SF

CRITICAL AREAS LEGEND

TEMPORARY DISTURBANCE

PERMANENT DISTURBANCE

TREE RETENTION

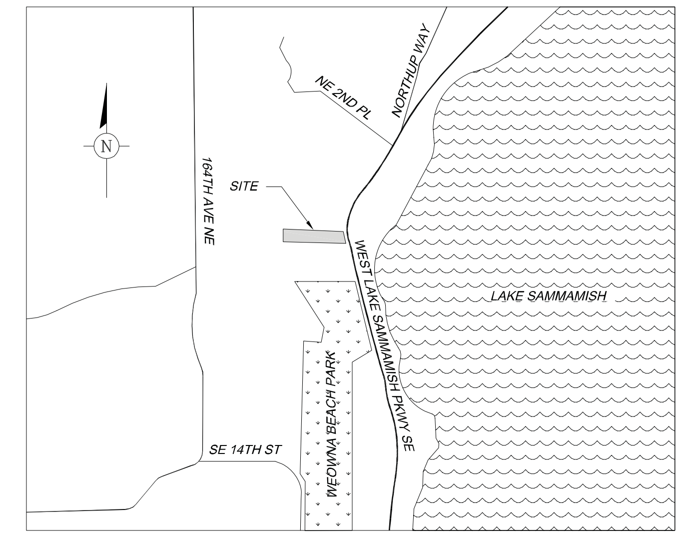
TREES TO BE REMOVED

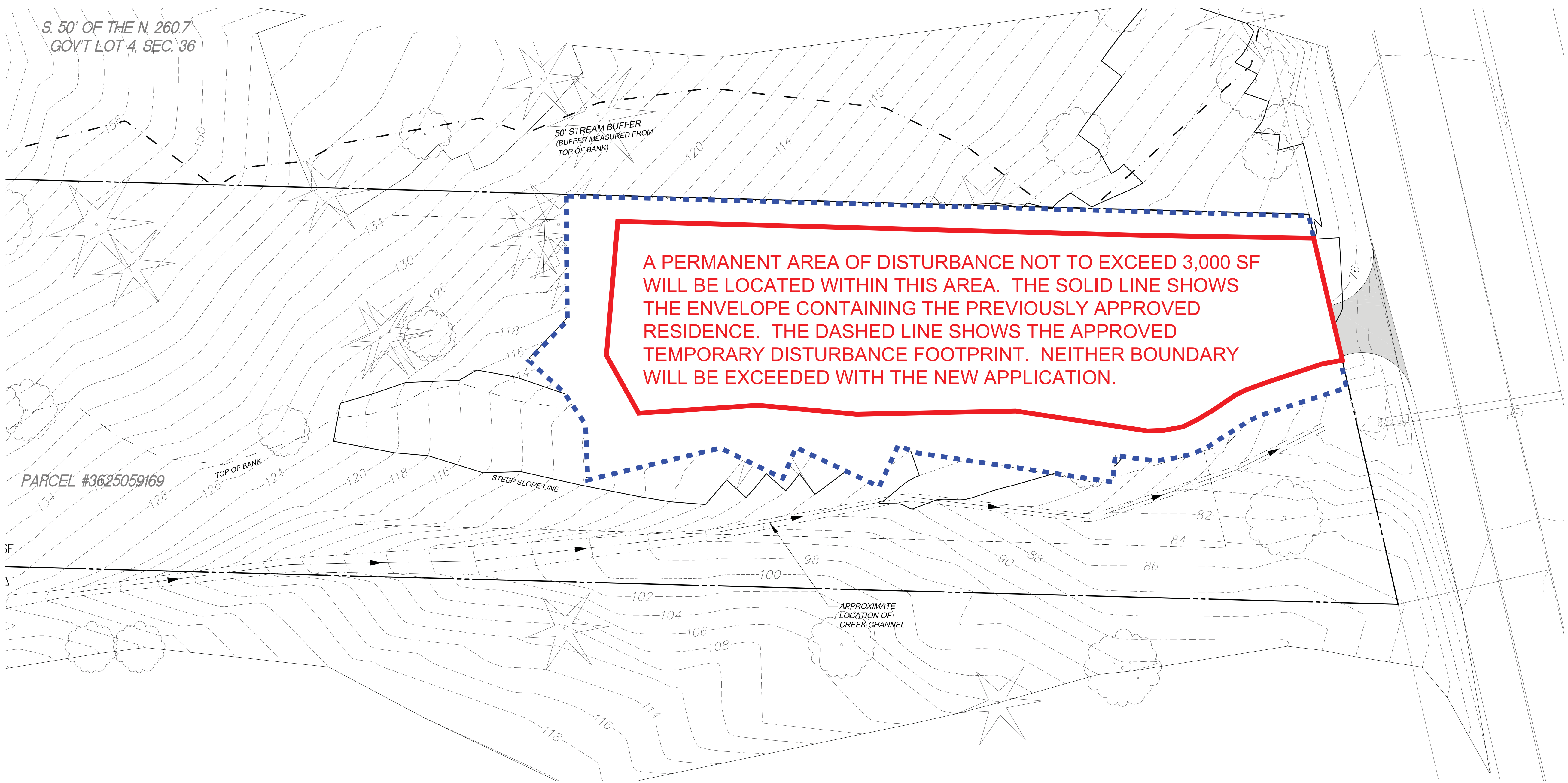
TREES TO BE RETAINED

SITE DISTURBANCE

AREA OF IMPACT (SQUARE FEET)	DISTURBANCE (SQUARE FEET)	
	TEMPORARY DISTURBANCE	PERMANENT DISTURBANCE
STEEP SLOPE	1,349 SF	1,198 SF
* STEEP SLOPE BUFFER	N/A	N/A
STREAM	1201 SF	250 SF
STREAM BUFFER	3,430 SF	2,973 SF
TOTAL CRITICAL AREA IMPACT (INCLUDES ALL IMPACTED CRITICAL AREAS AND AREAS OF OVERLAP)	3,634 SF	2,973 SF
NON-CRITICAL AREA	5 SF	0 SF
TOTAL SITE IMPACT (CRITICAL AREAS & NON-CRITICAL AREA)	3,639 SF	2,973 SF

* NO STEEP SLOPE BUFFER ONSITE





CEDAROCK CONSULTANTS, INC.
Environmental Consulting

September 22, 2014

Mr. Amrik Kamoh
9423 NE 130th Place NE
Kirkland, Washington 98034

Subject: Stream Report Update
Kamoh Residence
439 West Lake Sammamish Parkway SE, Bellevue, Washington

Dear Mr. Kamoh:

This letter serves to update the Stream Survey I completed at the subject property in May 2006. Per your request I revisited the site and walked the stream channel from West Lake Sammamish Parkway SE upstream for about 100-feet past the proposed development site. I found very few differences from the 2006 survey. Most of the pin flags I had placed to demark the OHWM in 2006 were still present.

The only change to my previous conclusions would be to upgrade the stream to a Type N classification following discussions with City of Bellevue staff.

Please let me know if you have any questions.

Sincerely,

Carl G. Hadley
Principal Biologist
Cedarock Consultants, Inc.

CEDAROCK CONSULTANTS, INC.
Environmental Consulting

May 25, 2006

Heather Washburn
240 West Lake Sammamish Parkway SE
Issaquah, WA 98008

Subject: Water Typing Analysis
439 West Lake Sammamish Parkway
Parcel #3625059169

Dear Ms. Washburn,

This letter-report provides results of a water typing analysis I conducted on a small watercourse running across the property referenced above. The purpose of the survey was to evaluate potential fish use of the watercourse and assess water type under the new City of Bellevue Critical Areas Ordinance (20.25H.075). The survey was conducted on the morning of May 25, 2006 by a professional fisheries biologist with over 17 years of experience in western Washington. Weather was cool and overcast. A substantial amount of rain had fallen over the previous 3 days and rainfall totals for the water year were 111 percent of normal.

A stream channel runs from west to east across parts of the subject property. The channel was walked from West Lake Sammamish Parkway upstream (west) to the headwater springs just off-site. The active channel (between left and right ordinary high water marks) ranges from approximately 6 to 24-inches wide with an average of about 10-inches. Average depth is about 0.5-inches and maximum depth is about 2-inches. The average gradient across the site is 27 percent. Substrate generally consists of a very thin to scattered layer of gravel over a sand base but becomes dirt, muck, and/or till near the headwaters.

Instream flow at the eastern property boundary was approximately 10 gallons per minute (gpm) or 0.02 cubic feet per second (cfs) and dropped to much less than 1 gpm at the western boundary. A number of springs and side tributaries supplement flow as the channel crosses the property. Water temperature at 10:30am was 11.0 ^{o}C (52 ^{o}F). It is unknown whether or not the stream flows all year.

The stream is collected in the City's stormwater system near the eastern property boundary. It is unknown where the storm drain discharges but a cursory examination of the area on the opposite side of the Parkway indicates the stream does not daylight anywhere near the road. It appears that the pipe carries flow downslope to a discharge point at Lake Sammamish. Assuming a relatively direct path under the adjacent driveways, this is a distance of approximately 300 feet at a 15 percent grade. This would present an impassable barrier to fish migrating up from the lake.

No fish were observed in the on-site stream. Given the small channel size, shallow depth, and lack of pools and overhead cover, it is likely that any fish would have been visible. The channel does not contain features normally considered fish habitat and does not contain all the features that would be necessary for salmonids to complete their full life history (spawning, incubation, and rearing). All of these types of habitat would be required to support an isolated population. The very high average gradient created stream velocities in excess of one foot per second. No pools or other resting/holding habitat were present. The high water velocity combined with the shallow depth produces conditions outside normal habitat suitability criteria for salmonids.

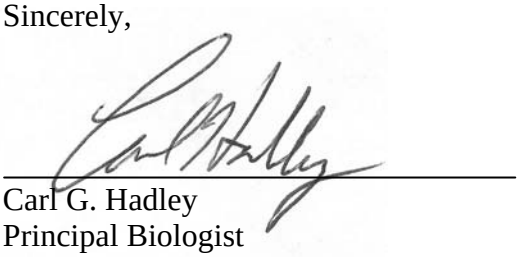
It is doubtful any fish could access the property were suitable habitat available. The long steep culvert downstream of the site is probably not passable by fish. While this culvert is manmade, certain conditions can occur which allow some areas upstream of legal human-made barriers to be considered non-fish habitat. These conditions apply here:

1. The human-made barrier is located beneath public infrastructure that is unlikely to be replaced due to the high cost and miniscule benefit.
2. The human-made barrier is not identified for removal.

In conclusion, it is my belief based on conditions observed that the channel on the subject property should reasonably be classified as a **Type O Water** under the new City of Bellevue CAO due to it's non-fish-bearing status and lack of physical connection via above ground channel to downstream waters. Type O Waters on an undeveloped site require a 25-foot buffer.

Please let me know if you have any questions.

Sincerely,



Carl G. Hadley
Principal Biologist
Cedarock Consultants, Inc.

P.S. Orange pin flags were placed along the north side of the main stream channel and labeled S1 to S39 (downstream to upstream). A channel width of 18-inches could be assumed for mapping. A small wet area/tributary to the north starting near Flag S16 was flagged at the centerline. The following widths could be assumed: S40 – 15', S41 and S42 – 10', S43 – 3'. This area should be examined by a wetlands specialist for possible detailed delineation. An old water supply dam was observed near S21. A major tributary to the south was observed near S26. A minor tributary to the south was observed near S34. Several springs were noted near S37.

CRITICAL AREAS REPORT

KAMOH RESIDENCE

439 West Lake Sammamish Parkway

Parcel #3625059169

Bellevue, Washington

Prepared for:

Mr. Amrik Kamoh
9423 NE 130th Place NE
Kirkland, Washington 98034

Prepared by:

Cedarock Consultants, Inc.
19609 244th Avenue NE
Woodinville, Washington 98077

September 23, 2014

This report and conceptual mitigation plan were prepared by Carl Hadley, a professional biologist with over 25 years of experience in western Washington.

Cedarock Consultants, Inc. 2014. Critical Areas Report for Kamoh Residence, 439 West Lake Sammamish Parkway, Bellevue, WA. Consultant Report prepared for Mr. Amrik Kamoh. September 23, 2014.

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1.0 PROPOSED PROJECT

1.1 Project Description and Critical Area Overview

Construction of a new house and driveway is proposed on a 1.30 acre undeveloped site more than 99 percent encumbered by critical areas including a type N stream, steep slopes, and two category IV wetlands. No sensitive wildlife habitat was identified on the site. Variance from standard critical areas code and lot coverage requirements is needed under a reasonable use exception (LUC 20.25H.200) to allow development of a maximum 3,000 sq.ft. residence. This report describes critical areas on the site, identifies proposed impacts, and describes conceptual mitigation being proposed to compensate for work in the critical areas.

The house and driveway would be constructed within the standard 50-foot buffer of a watercourse considered to be a Type N Stream by City of Bellevue staff. Buffer reduction to a minimum of 0 feet for the house and 0 feet for the driveway is proposed as the only way to obtain reasonable use of the property. Mitigation for buffer reduction will consist of buffer expansion elsewhere on the property, buffer enhancement, large woody debris placement, and a five-year monitoring program. Impacts will be minimized by designing the house and driveway to allow preservation of all but between four to six existing large trees on the site. The existing stream buffer to be disturbed consists predominantly of shrubs. Most of the mature trees on the site are located upslope and will be preserved. The proposed future condition is expected to be functionally equivalent to existing conditions and provide somewhat better riparian functions and values than if the site was developed under standard reasonable use exception rules.

Most of the house will be placed on a slope greater than 40 percent. A detailed subsurface exploration, geologic hazard, and preliminary geotechnical engineering study was completed. Results showed stiff or dense soils, and absence of ground water. These factors, combined with a lack of evidence of previous landslide activity on the site, indicate a relatively low risk of landsliding. With a number of site-specific design considerations provided by the geotechnical engineering consultants, the site is believed to be suitable for construction of the proposed house with generally acceptable risks.

Two category IV wetlands were found on the site approximately 90 feet west of the proposed house location. Both are hillslope wetlands created by seeps. One is approximately 400 square feet and the second is approximately 2,200 square feet. Neither wetland would be affected by the house.

The owner plans to use low impact development techniques throughout construction including siting and grading the house to minimize the number of trees that have to be cut as well as the amount of earth that has to be moved or removed.

1.2 Code Modifications

The following identifies each regulation and standard of the code intended to be modified by this proposal, further defining the relevant code requirement and the specific modification request for each. The discussion outlines the request for relief from the reasonable use exception standards and the impacts to the critical areas of streams and geologic hazard areas.

Streams

- *LUC 20.25H.075.C.1.a.i*: This code section designates stream critical area buffers for open streams on an undeveloped site.
    - Required Critical Area Buffer: (Type N stream) 50-ft measured from top-of-bank
    - ***Requested Modification:*** Reduce the critical area buffer to a minimum of 0 feet for the house and driveway. Up to **a**pproximately **3,000 sq.ft.** of stream critical area buffer will be permanently impacted.
- *LUC 20.25H.075.D.2.a.i*: This code section designates the structure setbacks for open streams on an undeveloped site.
    - Required Structure Setback: (Type N stream) 15 feet measured from edge of critical area buffer.
    - ***Requested Modification:*** Reduce the stream structure setback to 0 feet.

Geologic Hazard Areas

- *LUC 20.25H.120.A.2*: This code section designates steep slopes as a critical area.
    - Requirement for Critical Area: Slopes of 40 percent or more that have a rise of at least 10 feet and exceed 1,000 square feet in area.
    - ***Requested Modification:*** Allow development within steep slope areas by utilizing performance standards sited in 20.25H.125 and site-specific recommendations in AESI 2014[1].
- *LUC 20.25H.120.B.1.b*: This code section designates the steep slope critical area buffer.
    - Required Critical Area Buffer: 50-ft from top-of-slope.
    - ***Requested Modification:*** Allow development on and immediately adjacent to steep slope areas by utilizing performance standards sited in 20.25H.125 and site-specific recommendations in AESI 2014.
- *LUC 20.25H.120.C.2.b*: This code section designates the structure setbacks for steep slopes.
    - Required Structure Setback: 75-ft toe-of-slope setback
    - ***Requested Modification:*** Allow development within 75-feet of the toe of steep slope areas by utilizing performance standards sited in 20.25H.125 and site-specific recommendations in AESI 2014.

[1] Associated Earth Sciences, Inc. 2014. Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report, Washburn Residence, Bellevue, Washington. Prepared August 1, 2006 and updated September 19, 2014

Variance Request

- *LUC 20.20.010.* This code section describes maximum lot coverage.
  - Requirement: 35 percent land coverage by structures after subtracting all critical areas and stream critical area buffers.
  - ***Requested Modification:*** Because less than 0.4 percent of the site (216 sq.ft.) is unencumbered, a variance is requested to allow development on the site to a maximum permanent disturbance of 3,000 sq.ft. (5.3 percent of site).
- *LUC 20.25H.200.A.2.b.i*: This code section described reasonable use guidelines for small lots.
  - Required Critical Area Buffer: Areas zoned R-1.8 require a reasonable use exception if developable area is less than 3,000 sq.ft.
  - ***Requested Modification:*** A variance is requested to allow development on the site to a maximum permanent disturbance of 3,000 sq.ft.

1.3 Decision Criteria

This section summarizes how the proposed action is designed to meet decision criteria found in Sections 20.30P.140 and 20.25H of the Land Use Code.

Under **LUC 20.30P.140** (Decision criteria) the Director may approve or approve with modifications an application for a Critical Areas Land Use Permit if:

A. The proposal obtains all other permits required by the Land Use Code; and

The applicant will work with the City of Bellevue to identify and obtain all required land use and building permits needed to build a single-family residential structure on this lot..

B. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer; and

As described further in Section 5.1 of this Critical Areas Report, impact avoidance was the primary concern when designing the proposed development footprint. Most of the critical areas including the most valuable wildlife habitat, the two wetlands, and the stream will be avoided. It is not possible to develop a house on unencumbered land. The house will be located within buffers and on a steep slope found by geotechnical engineers to be stable. Compensatory mitigation will be provided for unavoidable impacts.

C. The proposal incorporates the performance standards of Part 20.25H LUC to the maximum extent applicable; and

This has been done. See discussion below.

D. The proposal will be served by adequate public facilities including streets, fire protection, and utilities; and

The proposed house will be located adjacent to West Lake Sammamish Parkway, a major city street served by all required public utilities and services.

E. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC 20.25H.210; and

A conceptual mitigation plan has been provided to restore and enhance all areas of the buffer that are currently degraded, or will suffer temporary disturbance during construction of the house. The final mitigation plan will be provided with submittal of the building plans once the precise location of the house and driveway is known.

F. The proposal complies with other applicable requirements of this code.

We believe this is true.

Under **LUC 20.25H.255** (Decision Criteria – Proposals to Reduce Regulated Critical Area Buffer) the Director may approve, or approve with modifications, a proposal to reduce the regulated critical area buffer on a site where the applicant demonstrates:

1. The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in overall critical area or critical area buffer functions;

A conceptual restoration plan designed to ultimately provide a net gain in buffer functions and overall habitat value is described in Section 5.4 of the CAR. The net gain will come from enhancing areas currently degraded by infestations of invasive, non-native plants; the addition of woody debris to the stream and riparian buffer; and by replacing removed trees at a 3:1 ratio.

2. The proposal includes plans for restoration of degraded critical area or critical area buffer functions which demonstrate a net gain in the most important critical area or critical area buffer functions to the ecosystem in which they exist;

Steep slopes and stream buffers on the site that are currently degraded by dense infestations of invasive, non-native plants (e.g. English ivy and Himalayan blackberry) will be restored by removing the plants and installing native species designed specifically to enhance wildlife habitat value and slope protection (see Section 5.4 of the CAR).

3. The proposal includes a net gain in stormwater quality function by the critical area buffer or by elements of the development proposal outside of the reduced regulated critical area buffer;

Although stormwater quality coming from the site is not believe to be compromised, new vegetative plantings in degraded portions of the riparian buffer should provide increased beneficial nutrient and leaf litter inputs, and should reduce surface erosion from steep slopes where informal trail have left the surface unprotected.

4. Adequate resources to ensure completion of any required restoration, mitigation and monitoring efforts;
   The applicant will post a bond for mitigation and monitoring if required by the City of Bellevue. The bond amount will be determined one the final mitigation plan is prepared.

5. The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical area and critical area buffers off-site; and

   All proposed development is located in an area which slopes toward the on-site stream so drainage issues are not expected to be a problem. Development will eliminate only about five percent of the large trees on the site so a relatively intact canopy will remain. This is important in protecting forested off-site areas from increased damage due to blow down. Steep slopes, including those that extend off-site, will be protected using site-specific design guidelines and monitoring by professional geotechnical engineers. Development of a single small foot-print house in the proposed location near the road is reasonably not expected to have any off-site impacts to critical areas and critical area buffers.

6. The resulting development is compatible with other uses and development in the same land use district.

   The applicant is requesting development of one relatively moderately-sized home that is entirely consistent with the home sizes and uses enjoyed on other lots in this neighborhood.

2.0 PROJECT LOCATION

The proposed action is located at 439 West Lake Sammamish Parkway in the City of Bellevue (Figure 1). A watercourse meanders on and off the property along the southern boundary.

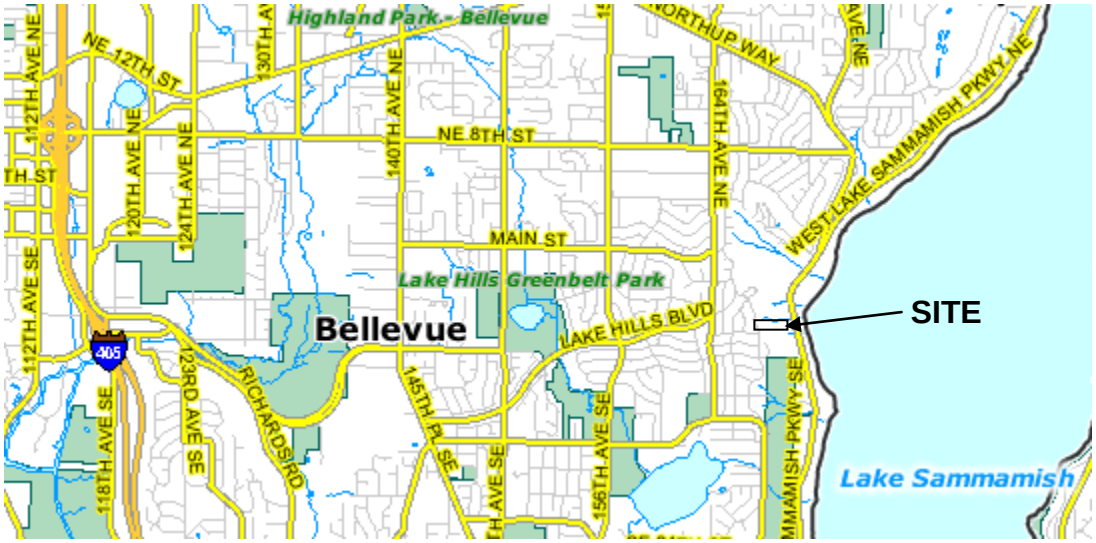


Figure 1. Vicinity Map

3.0 EXISTING CONDITIONS

Critical areas include a Type N stream channel, a riparian buffer, two Category IV wetlands, wetland buffers, and slopes in excess of 40 percent exist on the subject property. Adjoining properties also include critical areas including the stream and buffer, possible additional wetlands, and continuation of the steep slopes.

This section provides a description of critical areas and proposed disturbances. Environmental effects are described in Section 4.0.

3.1 Stream

The stream survey was conducted on May 25, 2006, and updated on September 4, 2014[2] by Carl Hadley, a professional fisheries biologist. A stream with an average depth of 0.5-inch, a maximum depth of about 2-inches, an average width of 10 inches, and an average gradient of 27 percent runs from west to east across parts of the subject property and the property to the south. The stream is collected in the City's stormwater system along West Lake Sammamish Parkway near the eastern property boundary. It then travels at least 300 feet downslope at a 15 percent grade to Lake Sammamish.

Given the small channel size, steep gradient, shallow depth, and lack of habitat, the stream was classified as a Type N waterbody. Type N waters have a 50-foot riparian buffer and a 15-foot building setback under LUC 20.25H.035.

3.2 Wetlands

A critical areas evaluation was conducted by Dr. Kenneth E. Neiman, Ph.D., Certified Senior Ecologist, to identify and evaluate any wetlands on the site (Resource Analysis *and* Management 2014[3]). Wetland investigations were conducted using methods outlined in *Washington State Wetland Identification and Delineation Manual (Ecology #96-94)*.

The site was visited on October 18, 2006 and again on September 12, 2014 to perform a wetland determination and search for regulated wildlife habitat for areas that are on or contiguous with the proposed activities. Two Category IV wetlands were observed and flagged. A wildlife survey for sensitive species and their habitat was also completed (See Section 3.4).

3.3 Steep Slopes

Most of the site (approximately 80 percent) consists of slopes in excess of 40 percent, including most of the proposed building footprint (Design Sheet 2). A subsurface exploration, geologic

[2] Cedarock Consultants, Inc. 2014. Water Typing Analysis, 439 West Lake Sammamish Parkway. Consultant report prepared for Heather Washburn. May 25, 2006 and updated on September 22, 2014.

[3] Resource Analysis *and* Management. 2014. Critical Areas Evaluation - Tax Parcel #3625059169, City of Bellevue. Consultant report prepared for Heather Washburn. October 23, 2006 updated on September 14, 2014.

hazard, and preliminary geotechnical engineering report was prepared to provide information to be utilized in the preliminary design and construction of the residence (Associated Earth Sciences, Inc. [AESI] 2014). The study included a review of City codes, available geologic literature, drilling three exploration borings, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and ground water conditions. Geotechnical engineering studies were also conducted to determine allowable foundation soil bearing pressures, suitable types of foundations, lateral earth pressures, shoring design, and recommendations for site preparation, drainage considerations, and erosion control.

The field study included drilling three exploration borings to gain information about the site. All exploration borings encountered medium stiff silt, interpreted as weathered transitional beds. The depths of the weathered transitional beds ranged from 12 to 15 feet. One boring encountered a hard, clayey silt interpreted as unweathered transitional beds at approximately 12 feet below the existing ground surface elevation. The transitional beds generally consist of a silt, clayey silt, and/or silty clay deposited in lowland or proglacial lakes. Transitional bed deposits typically possess high-strength and low-compressibility attributes, which are favorable for support of foundations, floor slabs, and paving with proper preparation. These sediments extended beyond the maximum depths explored of approximately 30 feet below the existing surface elevation at one boring and extended to a depth of approximately 16 feet at a second boring. Dense to very dense sand with gravel interpreted as Olympia beds were encountered below the colluvium at approximately 16 feet below the existing ground surface elevation at the second boring. Olympia beds generally consisted of dense to very dense sand and gravel. Olympia beds typically possess high-strength and low-compressibility attributes, which are favorable for support of foundations, floor slabs, and paving with proper preparation. These sediments extended beyond the maximum depths explored of approximately 20 feet below the existing surface elevation at the second exploration boring.

Ground water seepage was not encountered in any of the exploration borings.

The project site was characterized by a sloped topography, stiff or dense soils, and absence of ground water, and therefore was interpreted by AESI (2006) as a low landslide hazard risk. These factors, combined with no evidence of previous landslide activity on the site, present a relatively low risk of landsliding. The majority of the lower, east side of the site and upper, west side contain steep slopes, defined by the City of Bellevue as slopes of 40 percent or steeper.

3.4 Wildlife Habitat

The wildlife habitat review consisted of a site-specific survey (Resource Analysis and Management 2014) and consultation with the Washington Department of Fish and Wildlife

(2014)[4]. The Kamoh site is surrounded by land developed mostly as high-density single-unit residential housing. Although suitable wildlife habitat for terrestrial and avian species is found on this and adjacent property, it provides no corridor to or from adjacent tracts of much larger (greater than 250 acres) habitats. Species that may be expected to be found intermittently on this site are: deer, bear, coyote, mountain beavers, eastern grey squirrels, other assorted rodent species, raptors, woodpeckers, and song birds. There are several large conifer trees suitable for red-tailed hawk or owl nesting within the steep slope portion of the property, but no nesting activity by these species is occurring nor is known to have occurred in the recent past. Large trees in the area undoubtedly provide short-term perching sites for bald eagles, but none of these are known to be critical nesting or roosting habitat sites (WDFW 2014). Pileated woodpecker foraging activity was observed on scattered dead tree trunks, but there are no suitable sites for pileated woodpecker nesting in the area. No other species listed by the U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, King County, or City of Bellevue as threatened, endangered, sensitive or candidate are expected to utilize habitats found on this property. WDFW has classified much of the undeveloped hillside in the area that includes the Kamoh property as Urban Natural Open Space (UNOS). UNOS is listed as a priority habitat but no specific management guidelines are recommended. There are no priority species uses listed for this habitat unit in general or on the Kamoh property in specific (WDFW 2014).

4.0 EFFECTS ON CRITICAL AREAS

Critical areas on the site, critical area buffers, and proposed modifications to the buffers are quantified in Table 1. Effects of proposed development (including requested variances) on the functions and values of the critical areas and general mitigation measures are described below. A conceptual mitigation plan is provided in Section 5.0.

4.1 Streams

Non fish-bearing stream channels and their riparian buffers are important to the contribution of clean, cool, and productive flows to fish habitat downstream as well as providing wildlife habitat. Primary ecological functions provided by Type N stream channels and their buffers are described below along with a description of existing conditions for each function and an evaluation of the impact created by the project. Riparian functions and values are based on WDFW guidelines[5].

[4] Washington Department of Fish and Wildlife. 2014. Priority habitat and species map for T25R05E, Section 36. September 22, 2014.

[5] Knutson, K. L. and V. L. Naef. 1997. Management recommendations for Washington's priority habitats: riparian. Washington Department of Fish and Wildlife, Olympia, WA. 181p.

Table 1. Critical Area Impacts
(Maximum impacts based on conceptual design)

Type of Impact	Disturbance Area (sq.ft.)	
	Temporary	**Permanent**
Steep Slope	1,349	1,198
Steep Slope Buffer	0	0
Active Stream Channel [(a)]	0	0
Stream Channel [(b)]	1,201	250
Stream Buffer	3,430	3,000
Wetland	0	0
Wetland Buffer	0	0
Total [(c)]	**3,634**	**3,000**

[(a)] The portion of channel below ordinary high water where instream flow commonly occurs (RCW 77.55.011[11]**)**.
[(b)] Below top of bank per City of Bellevue Land Use Code.
[(c)] Totals include areas where buffers overlap.

4.1.1 Water Quality

Vegetation adjacent to streams can improve water quality by filtering pollutants, removing nutrients, and preventing sediment introduction. The water quality function of the existing on-site buffer is generally fair to good. While not dense due to the naturally shady character of the site, existing vegetation is for the most part native and well established. The thick, relatively undisturbed forest duff layer absorbs most rainfall so very little surface flow naturally occurs on the site.

The proposed action includes both temporary and permanent development within the stream buffer. Areas of temporary disturbance will be restored and replanted. Rain falling on these areas will continue to infiltrate and discharge to the stream channel. Drainage from new impervious surfaces including the house and driveway will be collected and routed downslope to the storm drain along West Lake Sammamish Parkway. No impervious surface will discharge to the buffer for treatment. Therefore, the water quality function of the remaining buffer will not change. Water discharged to the storm drain is piped directly to Lake Washington.

Under standard reasonable use exception rules a wider buffer would remain adjacent to the creek. As for the proposed action, neither case would result in water discharging from developed areas to the buffer. So no difference in water quality function would result with development under the proposed alternative.

4.1.2 Water Quantity

Natural vegetation and undisturbed soils moderate the rate at which rainfall is released to streams. As vegetation is removed, and soils compacted or paved, runoff from the area

typically increases resulting in physical channel changes and possible impacts to fish and macroinvertebrate habitat.

Stream flows in the onsite creek are controlled primarily by upslope groundwater contributions. No springs or tributaries feeding the creek will be impacted by the proposed action. While an increase in impervious surface is proposed, stormwater from the new paved surfaces will be collected and delivered to the stormwater system adjacent to West Lake Sammamish Parkway. The stormwater system downstream of the site is tightlined downslope to Lake Sammamish so no effect on channel morphology is possible. The action under both standard proposed reasonable use exception rules is not expected to have any adverse effect on instream flow rates or volumes.

4.1.3 Food

Type N streams are very important to stream productivity being the primary source of leaf litter and insects delivered to fish habitat downstream. Overhanging vegetation contributes leaves, vegetative litter, and small woody debris directly to the channel. This material forms the source of food for aquatic invertebrates, which are in turn eaten by fish. Terrestrial insects, another food source, also utilize riparian vegetation as habitat. The majority of material comes from directly over the stream. Function diminishes rapidly after about 25 feet from channels edge though some benefit is still realized up to about 50 feet away.

Because of the relatively mature forest class, and the relatively incised character of the channel, overhanging vegetation consists of small shrubs and forbs immediately adjacent to the channel, and the tree canopy layer 50 to 100 feet above the channel. No permanent disturbance of the stream bank within 9 feet of the flowing channel will occur so existing functions of the small shrub/forb layer will continue unchanged. A maximum of six large trees within 50 feet of the channel will be removed. All six of the trees contribute organic material to the channel.

The homeowners have located the house and driveway away from the highest density of large trees which is located further upslope. In addition, a buffer enhancement plan includes additional planting adjacent to the creek in the area to be exposed to increased lighting due to new canopy openings. Expanded buffers and permanent protection of plantings on the upper slope beyond the house will insure this densely vegetated area will continue to contribute material to the creek.

The loss of vegetative material from four to six removed trees is expected to be fully mitigated over time by the additional streamside plantings. In the short term, the additional LWD to be added by the applicant will help capture and hold small organic material, thus immediately improving aquatic macroinvertebrate habitat. No adverse change in food supply is expected and the proposed action will result in similar effects to standard reasonable use exception rules.

4.1.4 Microclimate

Riparian vegetation protects streams from climate changes caused by widespread development away from the stream, including soil and air temperature, humidity, and wind. There is no direct link between microclimate and the condition of salmonid habitat, however, it has been suggested that microclimate needs protection to maintain desirable assemblages of plants and animal species, including insects, beneficial to fish.

The removal of the four to six mature trees from within 50 feet of the creek will expose the channel to additional air movement and solar radiation. Preservation of additional large trees that normally might have been removed to develop this lot will help preserve the microclimate of the site. With the additional plantings proposed adjacent to the stream, the permanent protection of the upper forested slope, and the small footprint of the overall project, it is not expected any significant affect on microclimate will occur.

Under standard reasonable use exception rules additional large trees could be removed. Thus, the proposed action is expected to provide a small improvement over conditions that would occur under standard rules.

4.1.5 Temperature & Shade

All flow from the site drains to a storm drain system that flows a minimum of 300 feet underground before discharging to Lake Sammamish. Neither the proposed action or an action under standard reasonable use exception rules would be expected to have an adverse effect on water temperature in Lake Sammamish for three reasons:

1. All trees to be removed are located north of the stream channel thus contribute minimal shade to the stream,
2. The stream contains little flow during the summer. Thus, the net effect of the stream on water temperature in the 283,860 acre-ft Lake Sammamish would be insignificant,
3. While water temperature in the creek is not expected to be affected by removal of the trees or changes in microclimate, any slight change would be overwhelmed by the effects of travel through the buried culvert after flow leaves the site. The temperature of the buried culvert would be maintained at ground temperature year-round so the small amount of flow passing over the pipe would rapidly chill back to this temperature.

4.1.6 Human Access Control

One function of buffers in populated areas can be reducing the direct encroachment of humans on the watercourse. Buffers generally function most effectively when the adjacent land use consists of low intensity development. Because the proposed action and one developed under standard reasonable use exception rules consists of low density housing, and the lot is not generally accessible to other neighbors, the proposed action will have little effect on access control.

4.1.7 Woody Debris

Large and small woody debris consists of downed tree stems and branches and is a functionally important structural component of stream channels in the Pacific Northwest. In non-fish-bearing stream channels such as near the project site, woody material acts as a surface for biological activity which contributes to the productivity of a stream system. In a mature coniferous forest, the majority (70 to 90 percent) of wood in a stream comes from within 50 feet of the stream.

The existing channel contains a moderate quantity of instream wood. Numerous large trees on the property offers good future opportunity for recruitment of relatively high value coniferous debris and stems. All of the large trees proposed for removal might potentially have contributed woody debris to the channel under existing and future conditions. However, the trees are on the north side of the channel and prevailing strong winds usually come from the south. Therefore, the majority of their material shed by these trees might normally be expected to fall away from the channel.

As partial mitigation for removal of each large tree, the applicant will contribute and place three pieces of large woody debris (LWD) into the active channel. The logs/branches will be culled from trees being removed from the site and will meet specifications in the mitigation plan. New trees will be planted in the riparian buffer at a 3:1 ratio with removed trees to provide long term replacement of the woody debris function.

With the active placement of LWD, removal of only four to six trees, and preservation of all trees on the south side of the stream, the proposed action will have an insignificant adverse effect of woody debris recruitment to the channel.

4.1.8 Bank Stability

Roots from vegetation growing along the streambank help stabilize soils and reduce erosion. Root strength benefits are normally low beyond 40 feet from the channel. Due to the small size and generally low energy of the channel, virtually all root strength on this site comes from within 5 to 10 feet of the channel.

Under the proposed action, the applicant will stay at least 9 feet from the active channel. Some bank reinforcement will be completed as required in this area to maintain slope stability. Additional mitigation plantings will be provided to the remaining buffer wherever disturbance occurs.

4.2 Wetlands

All proposed construction is approximately 90 feet downslope of the wetlands and will have no effect on the two wetlands, their buffers, or hydrology.

4.3 Steep Slopes

Development of the site will require driveway access and building construction in steep slope areas. AESI (2006) provided a number of site-specific mitigation measures based on their site review under which construction of the residence and associated driveway and utilities could occur on the mid to lower (east) portion of the site with a relatively low risk of slope failure. These measures included routing stormwater away from steep slopes, maintaining as much existing vegetation as possible, minimizing fill, and utilizing appropriate structural footings. Additional measures were suggested to prevent soil erosion during and after construction. Preliminary site design recommendations were provided by AESI with a recommendation that additional geotechnical consultation be completed as the project design develops into the final product. With recommended mitigation measures, the site is believed to be suitable for construction of the proposed house within generally acceptable risks.

4.4 Wildlife Habitat

The large trees and dense patches of vegetation provide good urban wildlife habitat. Trees near the creek provide perching and nesting habitat for native and neo-tropical migrant birds. Woodpeckers, and possibly pileated woodpeckers may utilize some of the larger trees on the site. No other species of local importance (20.25H.150(A)) are known to, or likely to occur on or in the immediate vicinity of the site (WDFW 2014).

While the proposed development will eliminate several trees on the site and will bring additional human disturbance, permanent protection of the most valuable portion away from West Lake Sammamish Parkway will be preserved. Increased planting of native species adjacent to the creek will enhance wildlife habitat by providing both refuge habitat and a source of increased prey and vegetative material (for example fruit on huckleberry and currant).

With proposed mitigation, the overall effect on wildlife habitat of the proposed action is small. There is no critical wildlife habitat on the site (Resource Analysis and Management 2014, WDFW 2014).

4.5 Effects Summary

With the mitigation package consisting of avoidance of most large trees, enhanced planting near the stream, and placement of LWD, habitat value for most riparian functions under the proposed development action is expected to be relatively indistinguishable from existing conditions. Given that the entire watercourse downstream to Lake Sammamish is non-fish-bearing and in a culvert, the effect of the proposed action on fish, wildlife, and natural habitat will be negligible. No net loss of critical area function is expected as a result of the development.

While most of the building site consists of steep slopes, soils at depth are solid and there is no indication of past landsliding on the site. With site-specific design and construction measures

provided by the geotechnical engineer, the site is believed to be suitable for construction of the proposed house within generally acceptable risks.

The two on-site wetlands will not be affected by the proposed action.

There is no critical wildlife habitat on the site and proposed conservation measures will protect almost all large trees during development. With proposed stream and riparian buffer enhancements, the final site condition will maintain the mature canopy over 95 percent of the lot and create a younger age category of habitat near the eastern boundary. Despite permanent impacts to approximately 3,000 square feet of the lot, overall habitat quality is expected to be preserved.

Avoidance of steep slopes would require the entire project be constructed along the extreme eastern edge of the property where additional stream buffer and mature trees would be impacted. Because the proposed building site is stable, and allows construction further from the channel, this alternative is preferable as a way to protect sensitive areas.

4.6 Cumulative Effects

While some portion of the instream flow may come from the plateau upslope, the majority of flow in the on-site channel appears to originate from groundwater springs in the upper portion of the property to the south. And as described previously, upon leaving the site, all flow enters the city storm drain system where it is carried to Lake Sammamish. Thus, the above ground portion of the creek only exists on the subject and neighboring properties. Because the channel on the neighboring property is located on the steepest portion of the site (slopes much greater than 40 percent), any development would most likely occur well away from the channel to the east; thus no cumulative effects from future development near the channel are expected.

The proposed building is located downslope of the wetlands and will not affect them in any way. No critical wildlife habitat is present on the site. So no cumulative effects to wetlands or critical wildlife habitat is possible. The project has been designed with site-specific measures to protect slope stability. Any future projects in the vicinity would require the same analysis and mitigation actions. Thus, no cumulative effects are expected from the proposal to build on steep slopes.

5.0 MITIGATION PLAN

The goal of the Conceptual Mitigation Plan is to avoid, and then where necessary, to compensate for impacts to stream buffers, wetlands, steep slopes, and wildlife habitat created by development of the proposed action. Potential impacts to fish, wildlife, wetlands, and steep slopes, along with conceptual mitigation measures were described in Section 4.

5.1 Mitigation Process and Philosophy

Impact avoidance was the primary concern when designing the proposed development footprint. The two wetlands and the active stream channel (below ordinary high water) are completely avoided. But, because of the narrow lot and preponderance of steep slopes, impacts to the stream buffers could not be avoided altogether. So an effort was made to identify the least potential harm to the environment. When geotechnical engineers found a stable area for development near the east side of the property, the next concern was minimizing impacts to the stream buffer and particularly mature trees. While brush and young trees can be replaced, the site has an unusually large component of mature trees which the landowner wanted to preserve wherever possible.

5.2 Impact Avoidance

- No disturbance to the two wetlands and their buffers is proposed.
- No disturbance to the Type N stream channel below ordinary high water is proposed.

5.3 Impact Minimization

- The home was designed to be as close to the West Lake Sammamish roadway as possible;
- to be as far from the stream as possible;
- to be within the stable area identified by the geotechnical engineer;
- to avoid the large contiguous forested area on the upper slope; and
- to avoid as many of the large trees as possible on the lower slope.
- Permanent disturbance to the landscape will not exceed 3,000 square feet.

5.4 Impact Compensation

As quantified in Table 1, not all impacts could be avoided. While the active portion of the stream channel (below ordinary high water) could be avoided altogether, the regulated portion between ordinary high water and top of bank will be impacted. In keeping with the design philosophy of remaining as far from the stream as possible, the design maintains the structure well outside any potential for flow (the structure is a minimum of five feet above ordinary high water).

Compensation for impacts described in Section 4 is described in the following sections. Compensation takes two forms: repairing temporary disturbances to the riparian buffer (e.g. replanting) and compensating for enduring impacts to the buffer by providing permanent protection of substitute buffer area, and keeping stormwater away from steep slopes.

5.4.1 Stream Mitigation

Functions and values of the on-site sensitive areas are described above in Section 4.0. Stream-related functions and values, and project impacts to these functions and values are described in

Section 4.1. The conceptual mitigation design is described below. Final details to include a site-specific planting plan will be submitted with the final building plans.

Compensation:

1. Non-native plants will be removed from the riparian buffer. All non-native, noxious, and invasive plants as described by the Washington State Noxious Weed Control Board (*http://www.nwcb.wa.gov*) will be hand-removed from within 50-feet of the developed footprint of the project before new planting begins. The plants and roots will be dug up and removed from the site to prevent accidental spreading of cuttings or seeds. No herbicides will be allowed.
2. The riparian plant community within 50-feet of the developed footprint of the project will be enhanced, including all areas of temporary disturbance. A final buffer restoration plan will be prepared after the total extent of disturbance can be quantified. All non-developed areas on the Kamoh property within 50-feet of the final project footprint will be enhanced with native species plantings. This will include all areas within the riparian buffer where disturbance took place (and where no permanent development occurs) and other nearby areas that might benefit from additional planting. Existing native shrubs and trees will be counted in this area and additional plantings added to meet plant density requirements. Species shall be selected to enhance riparian function and value including bank stability, shading, nutrient contribution and wildlife habitat.

   The following three categories of plants will be counted within the buffer and enough additional plants added to achieve the final density as shown in Table 2.

Table 2. Planting Schedule

Species [1]	**Size**	**Final Buffer Density** [2]	**Final Count**
Trees (conifer)	Minimum 4 ft to 6 ft height	0.01 tree / sq.ft.	Minimum 12 trees (3:1 ratio)
Larger shrubs (e.g. willow, red-osier dogwood, salmonberry, elderberry, hazelnut, Nootka rose, vine maple, etc.)	2 gallon	0.05 plants / sq.ft.	To be determined [2]
Smaller shrubs (sword fern, sallal, snowberry, Oregon grape, etc.)	1 gallon	0.05 plants / sq.ft.	To be determined

[1] Prior to planting, the site shall be surveyed and species selected to meet specific site growing conditions. A minimum of three tree, five larger shrub, and five smaller shrub species will be selected for diversity.

[2] Final number of new plants to be added will be based on final design. Additional plants will be added if actual disturbance exceeds expectations during construction.

Planting will occur during the appropriate season within twelve months after all work in the buffer is complete. A final buffer restoration plan will be prepared and submitted for review to the City after the total area of disturbance can be quantified.

3. The applicant will contribute and place large woody debris (LWD) into the active channel within the area where the large trees will be removed at a 3:1 ratio with the number of trees removed. Logs and rootwads used for enhancement purposes shall consist of parts of the trees actually removed from the property (big leaf maple and western red cedar). Specifications for the LWD are described in Table 3.

Table 3. Large Woody Debris Specifications

Log Specifications	**4-8" DBH >6 feet length w/o rootball**	**8"-12" DBH 10-15 feet length w/o rootball**	**>12" DBH 10-15 feet length w/ rootball**
# Logs	33%	33%	34%

Root wads shall have a relatively even spread of roots with a minimum rootball diameter of four feet. Limbs shall be maintained on the stems to the greatest extent practical. Excess dirt shall be shaken off root wads prior to placement in the channel. All logs shall be placed by equipment operating outside of the ordinary high water. Logs shall be placed along waters edge at and below the ordinary high water mark. Exact log placement and grouping size shall be field adjusted by a biologist representing WDFW or the applicant during placement.

Due to the low energy of the subject stream, logs shall not be anchored. Instead, they shall be placed such as to provide natural resistance to movement. This can be accomplished by wedging longer logs into the banks and using small jams and root wads to create stability.

4. Monitoring will be conducted for five years with the purpose of ensuring the new plant community thrives and invasive species are discouraged (see Section 6 for details). Performance standards are described in Section 6.2.

5.4.2 Wetlands

Wetland mitigation consists of complete avoidance of all on-site wetlands and their buffers.

5.4.3 Steep Slopes

Development will occur on steep slopes. To mitigate potential damage, geotechnical engineers designed a number of site-specific measures necessary to protect slopes from failing and/or eroding. These measures are described in detail by AESI (2006 and 2014) and are summarized below. The report includes erosion and sediment control (ESC), and slope drainage measures

specific to the site. A final ESC and drainage plan taking these measures into consideration will be submitted to the City as part of the engineering design package to be provided later as part of the building plan.

Landslide Hazard Mitigation Measures

From AESI (2006) Section 6.0.

1. All surface and roof water is properly tightlined to an approved discharge location and is not allowed to flow over the slope face or near the slope crest.
2. The existing drain lines originating from outside of the site property should be rerouted in a way as not to direct any runoff onto the slope areas on the property.
3. Yard (lawn) areas should be graded such that irrigation water will flow away from the slope crest and into the site storm system.
4. As much of the existing vegetation should be retained as possible.
5. Areas where vegetation is removed should be replanted with deep-rooted, low-maintenance ground cover.
6. Excavations for structures should be sloped and/or shored, as recommended in this report.
7. Driveway grading should follow existing topography as much as possible to minimize grade separation walls.
8. Permanent landscape fills (non-structural) should be kept to a minimum and graded no steeper than 3H:1V (Horizontal:Vertical). Steeper, structural fills may be suitable with specific review and approval by AESI.
9. The structure footings should be placed on medium stiff to hard natural sediments or pile-supported where bearing soils are too deep for conventional footings. Footing and pile design should follow the recommendations in this report.

Erosion Hazards and Mitigation

From AESI (2006) Section 7.0.

1. Surface water should not be allowed to flow across the site over unprotected surfaces, nor should surface water be allowed to flow onto or over steep slopes.
2. All storm water from impermeable surfaces, including driveways and roofs and landscape areas, should be tightlined into approved facilities and not be directed onto or above cut or sloped areas.
3. Clearing beyond the areas to be developed should be avoided. Disturbed areas should be revegetated as soon as possible.
4. If possible, construction should proceed during the drier periods of the year.

5. A rocked construction entrance should be constructed to prevent tracking of soil onto adjacent right-of-ways.
6. Silt fences should be placed and maintained around the downslope perimeter of the proposed construction area and along the creek throughout the entire construction phase of the project until permanent landscaping and permanent storm water collection facilities have been installed.
7. Soils that are to be reused around the site should be stored in such a manner as to reduce erosion from the stockpile. Protective measures may include, but are not necessarily limited to, covering with plastic sheeting, the use of low stockpiles in flatter areas, or the use of straw bales and/or additional silt fences around pile perimeters. Soils should not be stockpiled on or nearby the steeply sloping or cut portions of the site.
8. Areas stripped of natural vegetation during construction should be replanted as soon as possible, or otherwise protected.

5.4.4 Wildlife Habitat

No critical wildlife habitat would be affected by the proposed action. Impacts to non-critical wildlife habitat will be mitigated by the riparian buffer improvements and set-asides discussed in Section 5.1.

6.0 MONITORING

Two types of monitoring will be required for this project. The first consists of construction monitoring to ensure steep slopes are protected during construction. The second consists of long term monitoring of riparian buffer plantings.

6.1 Construction Monitoring

At the time of this report, site grading, structural plans, and construction methods have not been finalized, and steep slope protection recommendations presented by AESI (2006 and 2014) are preliminary. Geotechnical review of the plans prior to final design completion was recommended by AESI to ensure proper interpretation and implementation of earthwork and foundation recommendations are reflected in the final design. It was also recommended that geotechnical engineering and monitoring services be provided during construction. The integrity of the foundations depends on proper site preparation and construction procedures. In addition, engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent.

6.2 Riparian Buffer Monitoring

6.2.1 Sampling Methodology

New plantings will be monitored in the fall once a year for a five year period. Monitoring will be conducted to quantify the survival, relative health and growth of plant material. An annual monitoring report submitted to the City following each years monitoring visit will describe and quantify the status of each mitigation component. The monitoring report will document the changes occurring within the planting areas and make recommendations for improving the degree of success or correcting any problems noted during monitoring. Monitoring reports will document how the riparian planting is meeting the goals and objectives of the plan.

Vegetation monitoring will consist of plant inspection to determine the health and vigor of the installation. All planted material in the buffer will be inspected during each monitoring visit to determine the level of survival of the installation. Each plant will be rated either dead, dying, or healthy. Dead or dying material will be replaced the following fall unless plant crowding is believed to be a problem. Plant species substitutions may be made if site conditions are believed responsible for plant mortality. Replacement plants must be approved by the City. Volunteer native, non-invasive species will be included as acceptable components of the mitigation project.

At least three photo points will be established giving complete coverage of the buffer area. Photos will be taken at each point during every monitoring visit and submitted as part of the annual monitoring report.

6.2.2 Standards of Success

- Logs shall persist in the stream channel upstream of the West Lake Sammamish Parkway right-of-way (ROW). Though logs are expected to shift periodically, and some movement downstream is expected, any logs which migrate to the ROW shall be retrieved and replaced in a new location within the mitigation area. Anchoring may be considered if migration becomes chronic.
- A thriving native riparian habitat is present within the planting area defined in the final landscape plan (to be prepared after construction of the house).
- Within the buffer area there is one hundred (100) percent survival after Year 1, ninety (90) percent survival after Year 3, and eighty (80) percent survival for all planted woody vegetation (shrubs and trees) at the end of Year 5.
- Within the buffer area there is not more than 2 percent cover of non-native invasive species at the end of each monitoring year.
- No significant areas of erosion (defined as material loss of greater than one cubic yard) occurs in the buffer area.

Volunteer native, non-invasive species will be included as acceptable components of the mitigation if they are thriving at the end of the monitoring period.

7.0 CONTINGENCY PLAN

A contingency plan would be implemented if necessary. Contingency plans would be developed based on the specific failure to meet success standards described in Sections 6.1 and 6.2.2 of this plan. Contingency plans could include changes to the foundation design, erosion control, additional plant installation, and plant substitutions including type, size, and location.

If monitoring results indicate that any of the performance standards are not being met, it may be necessary to implement all or part of a contingency plan. Careful attention to detail and site maintenance is essential in ensuring that problems do not arise. Should any of the site fail to meet success criteria, a contingency plan will be developed and implemented with City approval. Such plans are prepared on a case-by-case basis to reflect the failed mitigation characteristics.

Contingency/maintenance activities may include:

- Engineering plan revisions for foundations, drainage, slope protection, etc.
- Replacing all plants lost to browsing, drought, or disease, as necessary.
- Replacing any plant species with a 20 percent or greater mortality rate with the same species or similar species approved by the City Biologist.
- Irrigating the planting area only as necessary during dry weather if plants appear to be too dry, with a minimal quantity of water.
- Streambank erosion protection measures.
- Removing trash or other undesirable debris from the buffer areas as necessary.

8.0 MITIGATION COST ESTIMATE

A cost estimate for the riparian planting plan shall be provided with the final mitigation plan.

associated earth sciences incorporated

September 19, 2014
Project No. KE140520A

Mr. Amrik Kamoh
9423 NE 130th Place NE
Kirkland, Washington 98034

Subject: Geotechnical Report Update
Kamoh Residence
409 West Lake Sammamish Parkway SE
Bellevue, Washington

Reference: Associated Earth Sciences, Inc. (AESI) report titled "Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report, Washburn Residence, 409 West Lake Sammamish Parkway SE, Bellevue, Washington," dated August 1, 2006, prepared for Ms. Heather Washburn

Dear Mr. Kamoh:

In accordance with your request, this letter serves as an update to our 2006 geotechnical report for the subject site. Our work has been completed for the exclusive use of Mr. Amrik Kamoh, and his agents, in accordance with generally accepted geotechnical engineering practice. No other warranty, express or implied, is made.

INTRODUCTION

The project consists of the construction of a new single-family residence at 409 West Lake Sammamish Parkway SE in Bellevue, Washington. We have previously issued our "Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report," dated August 1, 2006 (attached), for a previously-planned project at the subject site. We understand that you are currently planning a residence with a similar building footprint to that previous proposed, and have requested that we review and update our previous report to reflect the currently planned project and current codes.

Our 2006 report describes the site as rectangular-shaped with dimensions of approximately 75 feet north-south and 755 feet east-west, and approximately 1.3 acres. The property is sloped towards the east for an overall topographic relief of approximately 200 feet. The property currently is an undeveloped forested area with a creek running through the south half of the site. At the time of our first site visit in 2006, we observed some flexible drain lines originating from the north running through the site to the creek. West Lake Sammamish Parkway SE borders the property to the east, to the north and west are currently occupied lots, and to the south is an undeveloped area.

SITE VISIT

We conducted a visit to the site on September 16, 2014. Based on our observations during our recent site visit, site conditions remain largely unchanged from that described in our 2006 report, including the presence of flexible drain lines originating from the north running through the site to the creek.

REPORT REVIEW

Upon completion of our review, we offer the following comments and recommendations:

Ground Motion

The spectral acceleration values provided in our 2006 report were based on the 2003 *International Building Code* (IBC). Since the time of our report, the City of Bellevue has adopted the 2012 IBC. Structural design of the proposed building should follow 2012 IBC standards using Site Class "C" as defined in Table 20.3-1 of *American Society of Civil Engineers* (ASCE) 7 – *Minimum Design Loads for Buildings and Other Structures*.

CLOSURE

With the exception of the comments listed above, it is our opinion that the current site conditions remain similar to those observed at the time of our previous study and the findings, conclusions, and recommendations provided in our August 1, 2006 report remain applicable. It should be noted that our previous report was preliminary and the recommendations in the report should be modified or verified as project plans become more well developed.

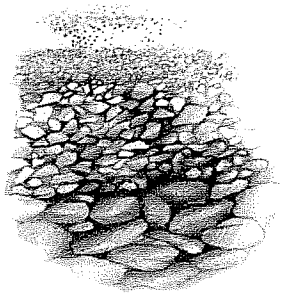
We appreciate this opportunity to have been of service to you with your project. Should you have any questions, or require additional information, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

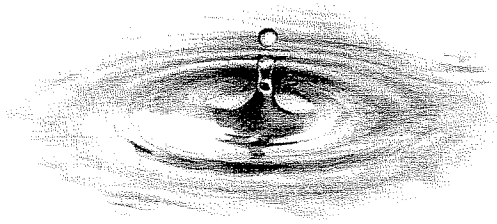
Jeffrey P. Laub, L.G., L.E.G.
Senior Project Engineering Geologist

Bruce L. Blyton, P.E.
Senior Principal Engineer

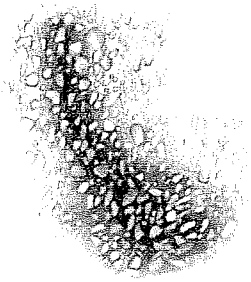
Attachment: Previous AESI Geotechnical Report Dated August 1, 2006



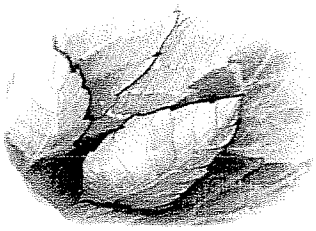
Geotechnical Engineering



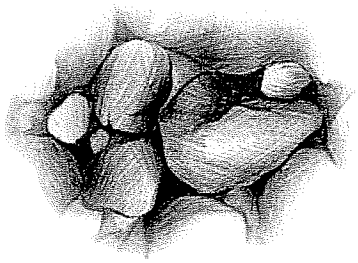
Water Resources



Environmental Assessments and Remediation



Sustainable Development Services



Geologic Assessments

Associated Earth Sciences, Inc.

Celebrating 25 Years of Service

Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report

WASHBURN RESIDENCE

Bellevue, Washington

Prepared for

Ms. Heather Washburn

Project No. KE060432A
August 1, 2006

Associated Earth Sciences, Inc.

Celebrating 25 Years of Service

August 1, 2006
Project No. KE060432A

Ms. Heather Washburn
240 West Lake Sammamish Parkway SE
Bellevue, Washington 98008

Subject: Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report
Washburn Residence
409 West Lake Sammamish Parkway SE
Bellevue, Washington

Dear Ms. Washburn:

We are pleased to present copies of the referenced report. This report summarizes the results of our subsurface exploration, geologic hazard, and preliminary geotechnical engineering studies and offers recommendations for the preliminary design and development of the proposed project. Our recommendations are preliminary in that project plans are still under development at the time of this report.

We have enjoyed working with you on this study and are confident that the recommendations presented in this report will aid in the successful completion of your project. If you should have any questions or if we can be of additional help to you, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Bruce L. Blyton, P.E.
Principal Engineer

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Projects\20060432\KE\WP

SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

WASHBURN RESIDENCE

Bellevue, Washington

Prepared for:
Ms. Heather Washburn
240 West Lake Sammamish Parkway SE
Bellevue, Washington 98008

Prepared by:
Associated Earth Sciences, Inc.
911 5th Avenue, Suite 100
Kirkland, Washington 98033
425-827-7701
Fax: 425-827-5424

August 1, 2006
Project No. KE060432A

I. PROJECT AND SITE CONDITIONS

1.0 INTRODUCTION

This report presents the results of our subsurface exploration, geologic hazard, and preliminary geotechnical engineering study for construction of a new single-family residence located at 409 West Lake Sammamish Parkway SE in Bellevue, Washington, as shown on Figure 1, Vicinity Map. Our recommendations are preliminary in that the site is currently undeveloped, and plans for the new construction are in preparation. In the event that any changes in the nature, design, or locations of the proposed structures are planned, the conclusions and recommendations contained in this report should be reviewed and modified, or verified, as necessary.

1.1 Purpose and Scope

The purpose of this study was to provide subsurface data to be utilized in preliminary design and construction of the new single-family residence at the above-referenced site. Our study included a review of City codes, available geologic literature, drilling three exploration borings with a portable Acker drill, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and ground water conditions. Geotechnical engineering studies were also conducted to determine allowable foundation soil bearing pressures, suitable types of foundations, lateral earth pressures, shoring design, and recommendations for site preparation, drainage considerations, and erosion control. This report summarizes our current fieldwork and offers preliminary geotechnical engineering recommendations based on our present understanding of the project.

1.2 Authorization

Written authorization to proceed with this study was granted by Ms. Heather Washburn. Our study was based on our visit to the site and accomplished in general accordance with our scope of work letter dated June 7, 2006. This report has been prepared for the exclusive use of Ms. Heather Washburn and her agents for specific application to this project. Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made. It must be understood that no recommendations or engineering design can yield a guarantee of stable soils and ground water. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the owner.

2.0 PROJECT AND SITE DESCRIPTION

This report was completed with an understanding of the project based on our discussions with Ms. Heather Washburn. The property is situated at 409 West Lake Sammamish Parkway SE in Bellevue, Washington, as shown on Figure 1. The property is rectangular-shaped with dimensions of approximately 75 feet north-south and 755 feet east-west, and approximately 1.3 acres. The property is sloped towards the east for an overall topographic relief of approximately 200 feet. The property currently is an undeveloped forested area with a creek running through the south half of the site. At the time of our first site visit, we observed some flexible drain lines originating from the north running through the site to the creek. West Lake Sammamish Parkway SE borders the property to the east, to the north and west are currently occupied lots, and to the south is an undeveloped area. The site is considered a Steep Slope and Erosion Hazard Area by the City of Bellevue.

We understand that a single-family residence and a studio area are proposed for the property. The proposed residence would be located towards the middle of the site in the flatter and accessible areas. The proposed studio would be located between the proposed residence and the road. The proposed residence will incorporate a daylight basement opening to the south and east. Cuts to a depth of approximately 15 to 20 feet below the existing grade at the west and north sides of the residence are proposed.

3.0 SUBSURFACE EXPLORATION

Our field study included drilling three exploration borings to gain information about the site. The various types of sediments, as well as the depths where characteristics of the sediments changed, are indicated on the exploration logs presented in the Appendix. The depths indicated on the logs where conditions changed may represent gradational variations between sediment types. If changes occurred between sample intervals in our borings, they were interpreted. Our exploration borings were located in the field by measuring from known site features. The approximate locations of the exploration borings are shown on Figure 2, Site and Exploration Plan.

The conclusions and preliminary recommendations presented in this report are based on our exploration borings completed for this study. The number, locations, and depths of the explorations were completed within site and budgetary constraints. Because of the nature of exploratory work below ground, interpolation of subsurface conditions between field explorations is necessary. It should be noted that differing subsurface conditions may sometimes be present due to the random nature of deposition and the alteration of topography by past grading and/or filling. The nature and extent of any variations between the field explorations may not become fully evident until construction. If variations are observed at that

time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

3.1 Exploration Borings

The exploration borings were completed by advancing a 3.75-inch, inside-diameter, hollow-stem auger with a limited access, portable drill apparatus. During the drilling process, samples were obtained at approximate 2.5- and 5-foot-depth intervals. The borings were observed and logged by a geotechnical engineer from our firm. The exploration logs presented in the Appendix are based on the field logs, drilling actions, and inspection of the samples collected.

Disturbed, but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with American Society for Testing and Materials (ASTM):D-1586. This test and sampling method consists of driving a standard 2-inch, outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140 pound hammer free-falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 blow counts are recorded within one 6-inch interval, the blow counts are recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils; these values are plotted on the attached boring logs. The samples obtained from the split-barrel sampler were classified in the field and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification and laboratory testing, as necessary.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the project site were inferred from the field exploration borings accomplished for this study, visual reconnaissance of the site, and review of applicable geologic literature. As shown on the field logs, the exploration borings generally encountered natural deposits consisting of medium stiff to stiff, silt to hard, clayey silt (transitional beds) over dense to very dense sands (Olympia beds). The following section presents more detailed subsurface information organized from the shallowest (youngest) to the deepest (oldest) sediment types.

4.1 Stratigraphy

Transitional Beds

All exploration borings encountered medium stiff silt, interpreted as weathered transitional beds. The depths of the weathered transitional beds ranged from 12 to 15 feet. Exploration boring EB-1 encountered a hard, clayey silt interpreted as unweathered transitional beds at approximately 12 feet below the existing ground surface elevation.

The transitional beds generally consist of a silt, clayey silt, and/or silty clay deposited in lowland or proglacial lakes. Transitional bed deposits typically possess high-strength and low-compressibility attributes, which are favorable for support of foundations, floor slabs, and paving with proper preparation. These sediments extended beyond the maximum depths explored of approximately 30 feet below the existing surface elevation at exploration boring EB-1 and extended to a depth of approximately 16 feet at EB-2.

Olympia Beds

Exploration boring EB-2 encountered a dense to very dense sand with gravel interpreted as Olympia beds below the colluvium at approximately 16 feet below the existing ground surface elevation.

The Olympia beds generally consisted of dense to very dense sand and gravel. Olympia beds typically possess high-strength and low-compressibility attributes, which are favorable for support of foundations, floor slabs, and paving with proper preparation. These sediments extended beyond the maximum depths explored of approximately 20 feet below the existing surface elevation at exploration boring EB-2.

Geologic Review

Review of the regional geologic map titled *Geologic Map of Seattle of the Issaquah 7.5' Quadrangle, King County, Washington* (D.B. Booth et al., 1991) indicates that the area of the subject site is underlain by transitional beds and Olympia beds. Our interpretation of the native sediments encountered at the site is in general agreement with the regional geologic map.

4.2 Hydrology

Ground water seepage was not encountered in any of the exploration borings. However, seepage may occur at random depths and locations, especially in interbedded silt/sand soils. It should be noted that fluctuations in the level of the ground water may occur due to the time of the year, variations in the amount of precipitation, adjacent stream flow, and changes in site development.

II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic, slope, and ground water conditions as observed and discussed herein. The discussion will be limited to potential seismic, landslide, and erosion hazards.

5.0 SEISMIC HAZARDS AND MITIGATION

Earthquakes occur in the Puget Lowland with great regularity. Fortunately, the vast majority of these events are small and are usually not felt by people. However, large earthquakes do occur, as evidenced by the 1949, 7.2-magnitude event; the 1965, 6.5-magnitude event; and the 2001, 6.8-magnitude event. The 1949 earthquake appears to have been the largest in this area during recorded history. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 25- to 40-year time interval in the Puget Sound area.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture, 2) seismically induced landslides, 3) liquefaction, and 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

5.1 Surficial Ground Rupture

Generally, the largest earthquakes that have occurred in the Puget Sound area are sub-crustal events with epicenters ranging from 50 to 70 kilometers in depth. Because of their depth, surficial faulting or earth rupture is usually not observed with these types of events.

The nearest known shallow fault trace to the project is the Seattle Fault. Recent studies by the United States Geological Survey (USGS) (e.g., Johnson et al., 1994, *Origin and Evolution of the Seattle Fault and Seattle Basin, Washington*, Geology, v. 22, pp. 71-74; and Johnson et al., 1999, *Active Tectonics of the Seattle Fault and Central Puget Sound Washington-Implications for Earthquake Hazards*, Geological Society of America Bulletin, July 1999, v. 111, n. 7, pp. 1042-1053) suggest that a northern trace of an east-west trending thrust fault zone (Seattle Fault) may project approximately 2 miles south of the project site. The recognition of this fault is relatively new, and data pertaining to it are limited, with the studies still ongoing. According to the USGS studies, the latest movement of this fault was about 1,100 years ago when about 20 feet of surficial displacement took place. This displacement can presently be seen in the form of raised, wave-cut beach terraces along Alki Point in West Seattle and Restoration Point at the south end of Bainbridge Island. The recurrence interval of movement along this fault system is still unknown, although it is hypothesized to be in excess

of several thousand years. Due to the suspected long recurrence interval and estimated distance from the project site, the potential for surficial ground rupture is considered to be low during the expected life of the structures.

5.2 Seismically Induced Landslides

No evidence of recent deep-seated or shallow landslides was observed on or adjacent to the property. The risk of a deep-seated landslide of the slope is considered to be low due to the presence and extent of stiff or dense soils. The risk of a shallow landslide of the surficial, medium stiff transitional bed soils is considered to be low to moderate due to the consistency of the sediments and vegetative cover. It is our opinion that the risk of damage to the proposed structures by seismically induced landsliding is low to moderate. Slope stability mitigations are presented in Section 6.0, *Landslide Hazards and Mitigation*.

5.3 Liquefaction

Liquefaction is a temporary loss in soil shear strength that can occur when loose granular soils below the ground water table are exposed to cyclic accelerations, such as those that occur during earthquakes. The observed site soils were generally medium stiff to hard silt or dense to very dense sand, and ground water was not observed; therefore the site soils are not expected to be prone to liquefaction. A detailed liquefaction analysis was not completed as a part of this study, and none is warranted, in our opinion.

5.4 Ground Motion

It is our opinion that any earthquake damage to the proposed structures, when founded on a suitable bearing stratum in accordance with the recommendations contained herein, will be caused by the intensity and acceleration associated with the event and not any of the above-discussed impacts. Structural design of the proposed buildings should follow the 2003 *International Building Code* (IBC). Information presented by the USGS Earthquake Hazards Program indicates a spectral acceleration for the project area for short periods (0.2 seconds) of $S_s = 1.33$ and for a 1-second period of $S_1 = 0.45$. Based on the results of subsurface exploration and on an estimation of soil properties at depth utilizing available geologic data, Site Class "C" in conformance with Table 1615.1.1 of the IBC may be used.

6.0 LANDSLIDE HAZARDS AND MITIGATION

The project site is characterized by a sloped topography, stiff or dense soils, and absence of ground water, and therefore is interpreted as a low landslide hazard risk. These factors, combined with no evidence of previous landslide activity on the site, present a relatively low risk of landsliding, in our opinion. The majority of the lower, east side of the site and upper,

west side contain steep slopes, defined by the City of Bellevue as slopes of 40 percent or steeper. Without mitigation, the City of Bellevue requires a 50-foot primary setback from the top of the slope and a 75-foot setback from the toe of slope, in accordance with Section 20.25H.070 (A4) of the *City of Bellevue Municipal Code*. The buffer can be reduced through a site-specific geotechnical evaluation and suitable mitigations.

Because much of the site are steep slope areas, development of the site will require driveway access and building construction in steep slope areas. In our opinion, construction of the residence, studio, and associated driveway and utilities may occur on the mid to lower (east) portion of the site with the following mitigations:

1. All surface and roof water is properly tightlined to an approved discharge location and is not allowed to flow over the slope face or near the slope crest.

2. The existing drain lines originating from outside of the site property should be rerouted in a way as not to direct any runoff onto the slope areas on the property.

3. Yard (lawn) areas should be graded such that irrigation water will flow away from the slope crest and into the site storm system.

4. As much of the existing vegetation should be retained as possible.

5. Areas where vegetation is removed should be replanted with deep-rooted, low-maintenance ground cover.

6. Excavations for structures should be sloped and/or shored, as recommended in this report.

7. Driveway grading should follow existing topography as much as possible to minimize grade separation walls.

8. Permanent landscape fills (non-structural) should be kept to a minimum and graded no steeper than 3H:1V (Horizontal:Vertical). Steeper, structural fills may be suitable with specific review and approval by Associated Earth Sciences, Inc. (AESI).

9. The structure footings should be placed on medium stiff to hard natural sediments or pile-supported where bearing soils are too deep for conventional footings. Footing and pile design should follow the recommendations in this report.

7.0 EROSION HAZARDS AND MITIGATION

Due to the slopes on the project site, soils present, and nature of the excavation below adjacent grades, there is a risk of erosion. To mitigate the erosion hazard and potential for off-site sediment transport, we recommend the following:

1. Surface water should not be allowed to flow across the site over unprotected surfaces, nor should surface water be allowed to flow onto or over steep slopes.

2. All storm water from impermeable surfaces, including driveways and roofs and landscape areas, should be tightlined into approved facilities and not be directed onto or above cut or sloped areas.

3. Clearing beyond the areas to be developed should be avoided. Disturbed areas should be revegetated as soon as possible.

4. If possible, construction should proceed during the drier periods of the year.

5. A rocked construction entrance should be constructed to prevent tracking of soil onto adjacent right-of-ways.

6. Silt fences should be placed and maintained around the downslope perimeter of the proposed construction area and along the creek throughout the entire construction phase of the project until permanent landscaping and permanent storm water collection facilities have been installed.

7. Soils that are to be reused around the site should be stored in such a manner as to reduce erosion from the stockpile. Protective measures may include, but are not necessarily limited to, covering with plastic sheeting, the use of low stockpiles in flatter areas, or the use of straw bales and/or additional silt fences around pile perimeters. Soils should not be stockpiled on or nearby the steeply sloping or cut portions of the site.

8. Areas stripped of natural vegetation during construction should be replanted as soon as possible, or otherwise protected.

III. PRELIMINARY DESIGN RECOMMENDATIONS

8.0 INTRODUCTION

Our exploration indicates that, from a geotechnical standpoint, the project is feasible with the understanding and acceptance that some risk of earth movement is inherent. In our opinion, the property is suitable for the proposed development provided the risks discussed are accepted and the recommendations contained herein are properly followed. The bearing stratum is at variable depths up to approximately 10 to 15 feet below the ground surface elevation. Due to the slope of the site and depth to bearing stratum, a partial spread footing/driven pile foundation is proposed. Temporary shoring may be necessary to support the cuts necessary to construct the residence basement level.

The following sections discuss our general recommendations for preliminary design and construction of the proposed project. We can also provide more detailed, project-specific design recommendations as the residence plans and shoring are developed.

9.0 SITE AND DRIVEWAY PREPARATION

Site preparation of planned building areas should include removal of any trees, brush, topsoil, debris, and other deleterious material within the proposed house and studio footprint, and driveway area.

The contractor must use care during site preparation and excavation operations so that the underlying soils are not softened. If disturbance occurs, the softened soils should be removed and the area brought to grade with structural fill. Consideration should be given to protecting access, driveway, and staging areas with an appropriate section of crushed rock.

If crushed rock is considered for the access, driveway, and staging areas, it should be underlain by engineering stabilization fabric to reduce the potential of fine-grained materials pumping up through the rock and turning the area to mud. The fabric will also aid in supporting construction equipment, thus reducing the amount of crushed rock required. We recommend that at least 10 inches of rock be placed over the fabric; however, due to the variable nature of the near-surface soils and differences in wheel loads, this thickness may have to be adjusted by the contractor in the field.

Grading on the driveway should be planned to minimize required cuts, fills, and retaining structures. Any required driveway cuts or fills should be sloped no steeper than 2H:1V. If steeper slopes are required for the driveway, they should be retained by engineered retaining walls that follow the recommendations discussed under the section on *Lateral Wall Pressures*.

Fill areas should follow the recommendations discussed under the section on *Structural Fill*, and should be reviewed by AESI.

10.0 TEMPORARY SHORING WALL RECOMMENDATIONS

It is our understanding that an excavation is currently planned for this project extending a maximum of approximately 15 to 20 feet below existing grade along the north and west sides. The cuts taper down to the east and south. A combination of open-cut slopes or excavation shoring may be used to support the proposed excavation. This section of the report presents preliminary design considerations and criteria for use in the design of either the unshored or shored excavation. With this information and other pertinent data, it should be the responsibility of the contractor, shoring subcontractor(s), or structural engineer to determine the appropriate design details, construction methods, and procedures for installation of the shoring system.

10.1 Temporary Unsupported Cut Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction based on local conditions encountered at the time. In areas where excavation cuts may be feasible, we anticipate that temporary, unsupported cut slopes in the unsaturated, medium stiff silts can be made at a maximum slope of 1.5H:1V. Layout should take into account the top of slope setback, the slope itself, and sufficient space at the toe of the slope to provide worker access. Steeper slopes than the above recommendation should be shored. As is typical with earthwork operations, some sloughing and raveling may occur, and cut slopes may have to be adjusted in the field. Unshored cuts into saturated soils are not recommended at any time. In addition, WISHA/OSHA regulations should be followed at all times.

10.2 Soldier Pile Wall

In areas where unsupported cuts are not feasible, we recommend the use of soldier piles as shoring. Soldier piles consisting of wide-flange beams are placed in pre-drilled holes that extend beyond the bottom of the excavation. The portion of each soldier pile extending below the bottom of the excavation is grouted in place with sufficient-strength concrete to transmit the soldier beam loads into the soil below the excavation level. The upper portion of the soldier pile is then backfilled with a relatively weak grout so that it may be removed, as necessary, for placement of lagging.

The soil conditions encountered in our exploration borings consisted primarily of medium stiff over stiff to very stiff silt. The stiff materials typically have high strength as the result of being overridden by glacial ice.

A wall design can be performed based on either "active" or "at-rest" soil pressure conditions. Active pressure assumes the soil is allowed to yield slightly, resulting in lower design earth pressures. At-rest conditions assume the soil is not allowed to yield and results in a higher design pressure. Active earth pressure design provides a more economic, lighter wall, but increased lateral movement and settlement behind the wall. At-rest pressure design results in a heavier, more costly wall, but a reduced risk of lateral displacement and settlement behind the wall, as well as any adjacent structures. Selection of the appropriate approach should address the potential damage/cost impacts and level of risk.

For design purposes, equivalent fluid densities of 40 pounds per cubic foot (pcf) may be used for level backsloped areas, and 50 pcf may be used for 3H:1V backslopes for unrestrained (active) conditions. For restrained at-rest conditions with horizontal backslopes, an equivalent fluid of 65 pcf is appropriate and 80 pcf for a 3H:1V backslope condition.

Below the retained soil zone, the lateral earth pressures will be resisted by "passive" soil pressures acting against the base of the pile shaft. An allowable passive equivalent fluid density of 350 pcf may be assumed to act over a width equal to twice the pile diameter. This value is appropriate for passive resistance against undisturbed, native transitional beds.

We recommend that the soldier piling be spaced at a maximum distance of 8 feet on-center. The entire space between the piles should be retained using treated wood lagging. Soils should be excavated from between the piles to facilitate placement of the wood lagging over the entire retained soil height. Voids behind the lagging must be backfilled with washed pea gravel or select, imported, clean, free-draining sand and gravel material, or lean-mix concrete/grout.

The actual required pile lengths, steel reinforcement, and other design details must be determined by a structural engineer. All values presented above assume that any ground water will be drained or drawn down to below base excavation levels during construction, and that the completed walls will be provided with drainage so that hydrostatic forces do not build up behind the wall. Therefore, we have not included hydrostatic forces in our design pressures.

11.0 FOUNDATIONS

It is our understanding that a partial spread footing/driven pile foundation is proposed for the residence. The conventional spread footing is proposed for the northwest portion of the single-family residence that is within the deep portion of the excavation. The piles are proposed for the remainder of the footing area where overexcavation to bearing soils is not feasible. Pile foundations are proposed for the studio.

Spread footings may be used for building support when founded on medium stiff to hard natural soils. We recommend that an allowable bearing pressure of 2,500 pounds per square foot (psf) be utilized for design purposes, including both dead and live loads. An increase of one-third may be used for short-term wind or seismic loading. Perimeter footings should be buried at least 18 inches into the surrounding soil for frost protection; interior footings require only 12 inches burial. However, all footings must penetrate to the prescribed bearing stratum, and no footing should be founded in or above loose, organic, or existing fill soils.

It should be noted that the area bounded by lines extending downward at 1H:1V from any footing must not intersect another footing or intersect a filled area that has not been compacted to at least 95 percent of ASTM:D-1557. In addition, a 1.5H:1V line extending down from any footing must not daylight because sloughing or raveling may eventually undermine the footing. Thus, footings should not be placed near the edge of steps or cuts in the bearing soils.

Anticipated settlement of footings founded on stiff to hard silt should be on the order of 1 inch or less. However, disturbed soil not removed from footing excavations prior to footing placement could result in increased settlements. All footing areas should be inspected by AESI prior to placing concrete to verify that the design bearing capacity of the soils has been attained and that construction conforms to the recommendations contained in this report. Such inspections may be required by the governing municipality. Perimeter footing drains should be provided, as discussed under the section on *Drainage Considerations*.

A deep foundation system consisting of small-diameter, driven steel pipe piles is recommended for the pile foundation portion of the residence (east portion) and studio, where footing depths are less than approximately 10 feet below existing grades. Pipe piles should consist of either 3-, 4-, or 6-inch-diameter pipe depending on the required structural loads. The piles should be steel pipe, driven with a suitable hydraulic hammer to the refusal criteria shown in Table 1. Table 1 provides required minimum hammer weights, refusal criteria, and allowable loads for pipe piles. Based on our explorations, pile lengths are estimated to be between 20 to 30 feet, but may vary considerably from or exceed this estimate due to the variations in hammer energy, soil types, and soil density.

Table 1
Pipe Pile Design Parameters

Pipe Diameter	Wall Thickness	Minimum Hammer Energy Rating	Refusal Criteria*	Allowable Load
3"	0.216" Sch. 40	550 ft-lb	15 sec.	10 kips
4"	0.237" Sch. 40	850 ft-lb	16 sec.	20 kips **
6"	0.280" Sch. 40	2,000 ft-lb	15 sec.	20-30 kips **

* Refusal is defined as less than 1 inch of penetration in "X" seconds under constant driving.
** Allowable load to be verified by load tests in accordance with ASTM:D-1145 "quick load test."

Anticipated settlement of pile-supported foundations should be less than ½ inch. Pile installation must be observed by AESI to verify that the design bearing capacity of the piles has been attained and that construction conforms to the recommendations contained herein. The City of Bellevue may also require such inspections.

Lateral resistance can be derived from passive soil resistance against the buried portion of the foundation or from the installation of batter piles. A passive equivalent fluid of 250 pcf can be used to account for lateral resistance. For batter piles, lateral resistance should be taken as the horizontal component of the axial pile capacity.

12.0 FLOOR SUPPORT

Floor slabs may be supported on structural fill, medium dense native soil, or on pilings. Where the residence can be supported on spread footings, slab-on-grade flooring can generally be used. In pile-supported portions of the buildings, either a pile-supported floor slab or a slab-on-grade placed over suitably recompacted or structural fill subgrade may be used. Slab-on-grade floors should be placed over medium stiff soils, or structural fill placed as recommended in the *Site Preparation* and *Structural Fill* sections of this report. Slab-on-grade floors should be cast atop a minimum of 4 inches of pea gravel or washed crushed rock to act as a capillary break. The floors should also be protected from dampness by covering the capillary break layer with a vapor retarder at least 10 mils in thickness.

13.0 LATERAL WALL PRESSURES

We anticipate that shoring walls will be designed as temporary walls with free-standing basement walls cast inside the shoring system with drainage aggregate backfilling between. Lateral earth pressures for shoring and permanent retaining walls are presented in Section 10.2. If free-standing walls are used (without permanent shoring), they should be designed using the same pressures as presented in Section 10.2. Permanent retaining walls should be designed with the same parameters as the temporary shoring walls.

As required by the 2003 IBC, retaining wall design should include a seismic surcharge pressure in addition to the equivalent fluid pressures presented above. Considering the site soils and the recommended wall backfill materials, we recommend a seismic surcharge pressure of 4H and 8H psf, where H is the wall height in feet for the active and at-rest loading conditions, respectively. The seismic surcharge should be modeled as a rectangular distribution with the resultant applied at the midpoint of the wall.

The lateral pressures presented are based on the conditions of a uniform backfill consisting of excavated on-site soils, or imported structural fill compacted to 90 percent of ASTM:D-1557. A higher degree of compaction is not recommended, as this will increase the pressure acting on the walls. A lower compaction may result in settlement of the slab-on-grade or other structures supported above the walls. Thus, the compaction level is critical and must be tested by our firm during placement. Surcharges from adjacent footings or heavy construction equipment must be added to the above values.

It is imperative that proper drainage be provided so that hydrostatic pressures do not develop against the walls. This would involve installation of a minimum, 1-foot-wide blanket drain to within 1 foot of finish grade for the full wall height using imported washed gravel against the walls. Perimeter footing drains should be provided for all retaining walls, as discussed under the section on *Drainage Considerations*.

14.0 PASSIVE RESISTANCE AND FRICTION FACTOR

Footings cast directly against undisturbed, native soils may be designed for passive resistance against lateral translation using an equivalent fluid equal to 250 pcf. If footings are placed on-grade and then backfilled, the top of the compacted backfill must be horizontal and extend outward from the footing for a minimum lateral distance equal to three times the height of the backfill before tapering down to grade. With backfill placed as discussed, footings may also be designed for passive resistance against lateral translation using an equivalent fluid equal to 250 pcf. The passive resistance value includes a factor of safety equal to 3 in order to reduce the amount of movement necessary to generate passive resistance.

The friction coefficient for footings cast directly on undisturbed, stiff to hard soils may be taken as 0.35. This is an allowable value and includes a safety factor. Since it will be difficult to excavate these soils without disturbance, the soil under the footings must be recompacted to at least 95 percent of the above-mentioned standard for this value to apply.

15.0 DRAINAGE CONSIDERATIONS

All perimeter footing walls, basement walls, and retaining walls should be provided with a drain at the footing elevation. Drains should consist of rigid, perforated, polyvinyl chloride (PVC) pipe surrounded by washed pea gravel. The level of the perforations in the pipe should be set at the bottom of the footing, and the drain collectors should be constructed with sufficient gradient to allow gravity discharge away from the buildings. Perimeter foundation walls should be lined with a minimum, 12-inch-thick, washed gravel blanket provided to within 1 foot of finish grade that ties into the footing drain. Roof and surface runoff should not discharge into the footing drain system, but should be handled by a separate, rigid,

tightline drain. If drainage geosynthetic is used, it should be installed per the manufacturer's specifications.

In planning, exterior grades adjacent to foundations should be sloped downward away from the structures to achieve surface drainage. Area drains or swales should be provided along the upslope side and yard areas of the residence to collect the runoff from the upslope and yard areas. All impervious surfaces should be sloped to drain into a site storm drain system that discharges to a City-approved location away from the site slopes.

16.0 STRUCTURAL FILL

Structural fill may be necessary to establish desired grades. All references to structural fill in this report refer to subgrade preparation, fill type, placement, and compaction of materials, as discussed in this section. If a percentage of compaction is specified under another section of this report, the value given in that section should be used.

After stripping, planned excavation, and any required overexcavation have been performed to the satisfaction of the geotechnical engineer or their representative, the upper 12 inches of exposed ground should be recompacted to a firm and unyielding condition, as determined by the geotechnical engineer or their representative. If the subgrade contains too much moisture, adequate recompaction may be difficult or impossible to obtain and should probably not be attempted. In lieu of recompaction, the area to receive fill should be blanketed with washed rock or quarry spalls to act as a capillary break between the new fill and the wet subgrade. Where the exposed ground remains soft and further overexcavation is impractical, placement of an engineering stabilization fabric may be necessary to prevent contamination of the free-draining layer by silt migration from below.

After the recompacted, exposed ground is tested and approved, or a free draining rock course is laid, structural fill may be placed to attain desired grades. Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer, placed in maximum 8 inch loose lifts, with each lift being compacted to at least 95 percent of ASTM:D-1557. In the case of roadway and utility trench filling, the backfill should be placed and compacted in accordance with King County codes and standards. The top of the compacted fill should extend horizontally outward a minimum distance of 3 feet beyond the locations of the perimeter footings or roadway edges before sloping down at a maximum angle of 2H:1V.

The contractor should note that any proposed fill soils must be evaluated by AESI prior to their use. This would require that we have a sample of the material at least 72 hours in advance to perform a Proctor test and determine its field compaction standard. Soils in which the amount of fine-grained material (smaller than the No. 200 sieve) is greater than approximately 5 percent (measured on the minus No. 4 sieve size) should be considered moisture-sensitive.

The on-site soil is estimated to contain more than 5 percent fine-grained material. Use of moisture-sensitive soil as structural fills should be limited to favorable dry weather and dry subgrade conditions. At the time of our exploration program, soil moisture contents were judged to be at optimum to above optimum for structural fill use. We anticipate that most excavated soils may require aeration and drying prior to compaction in structural fill applications. Construction equipment traversing the site when the soils are wet can cause considerable disturbance.

If fill is placed during wet weather or if proper compaction cannot be obtained, a select, on-site or import material consisting of a clean, free-draining gravel and/or sand should be used. Free-draining fill consists of non-organic soil with the amount of fine-grained material limited to 5 percent by weight when measured on the minus No. 4 sieve fraction, and at least 25 percent retained on the No. 4 sieve.

If fill is to be placed on slopes steeper than 5H:1V, the base of the fill should be tied to firm, stable subsoil by appropriate benching, which would be established in the field to suit the particular soil conditions at the time of grading. Generally, the benches for hillside fills should be at least 4 feet wide and cut into the stiff silt. All fills proposed on a slope should be reviewed by our office prior to construction.

17.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

At the time of this report, site grading, structural plans, and construction methods have not been finalized, and the recommendations presented herein are preliminary. We are available to provide additional geotechnical consultation as the project design develops and possibly changes from that upon which this report is based. We recommend that AESI perform a geotechnical review of the plans prior to final design completion. In this way, our earthwork and foundation recommendations may be properly interpreted and implemented in the design. This plan review is not included in the current scope of work and budget.

We are also available to provide geotechnical engineering and monitoring services during construction. The integrity of the foundations depends on proper site preparation and construction procedures. In addition, engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of this current scope of work. If these services are desired, please let us know, and we will prepare a proposal.

We have enjoyed working with you on this study and are confident that these recommendations will aid in the successful completion of your project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

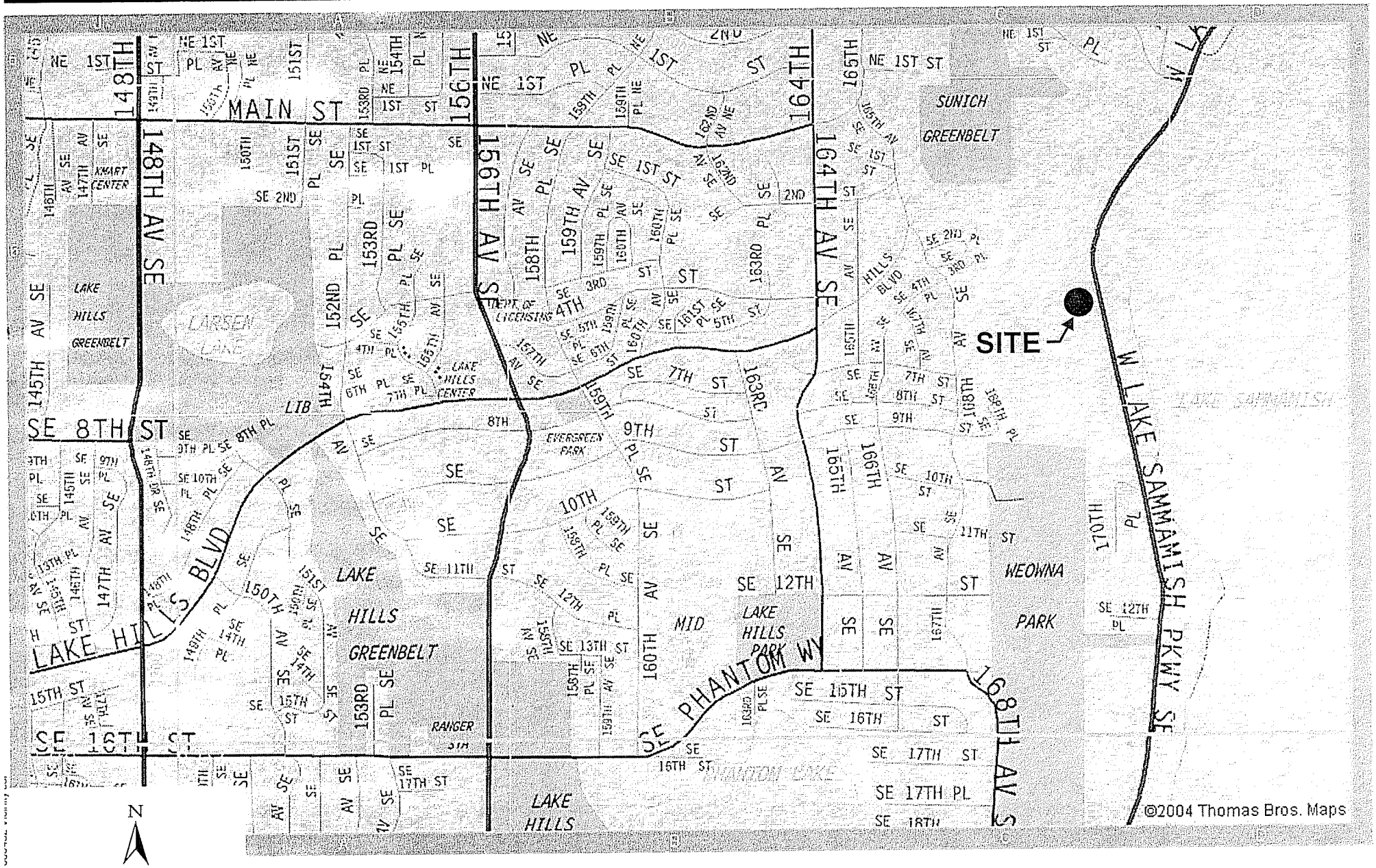
8/1/06

5/31/08

Su-Kiet Lieu, E.I.T.
Senior Staff Engineer

Bruce L. Blyton, P.E.
Principal Engineer

Attachments: Figure 1: Vicinity Map
Figure 2: Site and Exploration Plan
Appendix: Exploration Logs



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NO SCALE

Associated Earth Sciences, Inc.

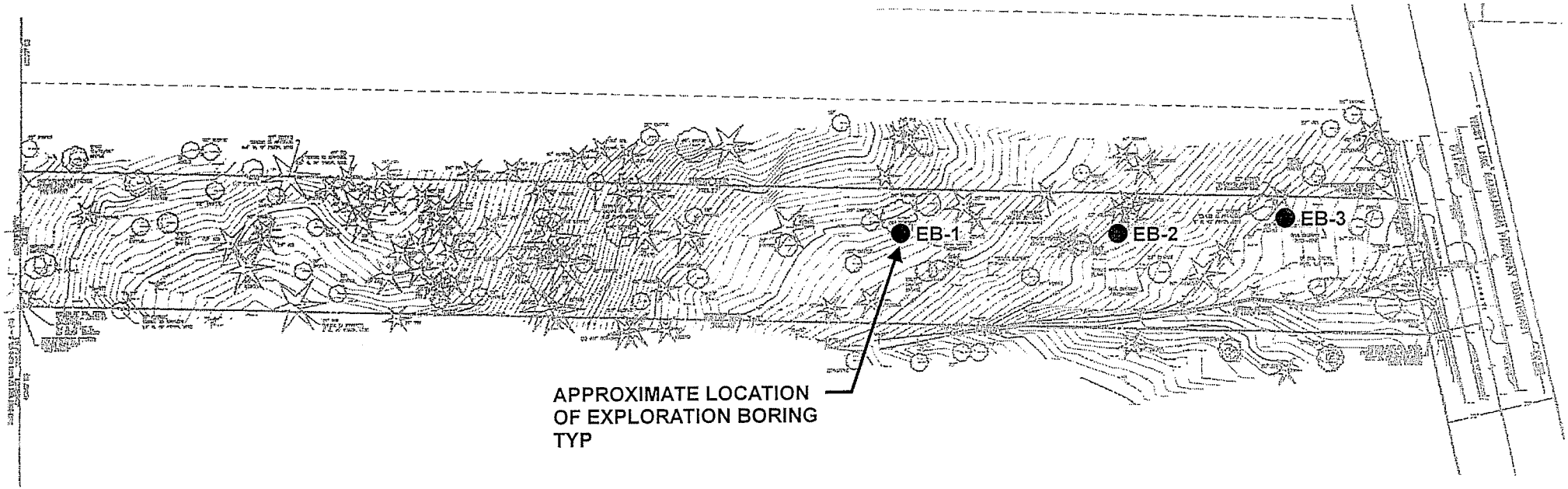
VICINITY MAP

WASHBURN RESIDENCE
BELLEVUE, WASHINGTON

FIGURE 1

DATE 7/06

PROJ. NO. KE060432A



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NO SCALE

Associated Earth Sciences, Inc.

SITE AND EXPLORATION PLAN
WASHBURN RESIDENCE
BELLEVUE, WASHINGTON

FIGURE 2

DATE 7/06

PROJ. NO. KE060432A

060432 Washburn Residence \ 060432 Site and Explr cdr

APPENDIX

Associated Earth Sciences, Inc.

Exploration Log

Project Number	Exploration Number	Sheet
KE060432A	EB-1	1 of 1

Project Name	Washburn Residence	Ground Surface Elevation (ft)	
Location	Bellevue, WA	Datum	N/A
Driller/Equipment	Geologic/Acker	Date Start/Finish	6/29/06,6/29/06
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Weathered Transitional Beds Brush cover, dry to moist, gray-brown, SILT, trace fine to medium sand; rootlets present (ML).					
		S-1		Same.			6 7 8	▲15	
5		S-2		Same, moist, 1/8 inch diameter rootlet present. Becomes moist to wet at 6 feet.			4 6 7	▲13	
		S-3		Moist, gray-brown, SILT, trace fine sand; trace amounts of rootlets present, <1/16 inch diameter (ML).			2 4 4	▲8	
10		S-4		Same, no rootlets and fracture at 11.5 feet.			4 8 19	▲27	
		S-5		**Transitional Beds** Same, rust stained, fractures along sample length and organic layers.			11 19 39		▲58
15		S-6		Same, rust stained in layers.			18 39 50/5"		▲50/5"
20		S-7		Moist, gray-brown, rust stained in layers, clayey SILT (MH). Vertical rust staining at 21 feet. Driller feels sand layers at 20 feet.			16 29 50/6"		▲50/6"
25		S-8		Same, no vertical rust staining.			16 35 50/5"		▲50/5"
30		S-9		Same.			26 50/6"		▲50/6"
				Bottom of exploration boring at 31 feet					
35									

Sampler Type (ST)

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: SKL

Approved by:

\ESIBOR 060432A.GPJ July 26, 2006

Associated Earth Sciences, Inc.

Exploration Log

Project Number	Exploration Number	Sheet
KE060432A	EB-2	1 of 1

Project Name: Washburn Residence
Location: Bellevue, WA
Driller/Equipment: Geologic/Acker
Hammer Weight/Drop: 140# / 30"

Ground Surface Elevation (ft):
Datum: N/A
Date Start/Finish: 6/29/06,6/29/06
Hole Diameter (in):

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Weathered Transitional Beds Brush cover, brown, clayey SILT, trace fine sand; rootlets present (MH).					
		S-1		Same.			4 5 6	▲11	
5		S-2		Same, with fine to coarse GRAVEL. Hard drill at 6 to 8 feet, gravel layer.			4 9 13	▲22	
		S-3		Same, no gravel.			6 7 8	▲15	
10		S-4		Same, fine sand lenses at 11 and 11.5 feet.			5 5 6	▲11	
15		S-5		Moist, olive-brown, clayey SILT (MH). 1 to 3 inch interbeds of fine to medium sand at 15, 15.5, and 16.25 feet.			8 14 19	▲33	
				Olympia Beds					
20		S-6		Moist, olive-brown, medium to coarse SAND with fine gravel (SP).			19 50/6"	▲50/6"	
				Bottom of exploration boring at 21 feet					
25									
30									
35									

Sampler Type (ST):
- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture
Water Level ()
Water Level at time of drilling (ATD)

Logged by: SKL
Approved by:

AESIBOR 060432A.GPJ July 26, 2006

Associated Earth Sciences, Inc.

Exploration Log

Project Number	Exploration Number	Sheet
KE060432A	EB-3	1 of 1

Project Name: Washburn Residence
Location: Bellevue, WA
Driller/Equipment: Geologic/Acker
Hammer Weight/Drop: 140# / 30"

Ground Surface Elevation (ft):
Datum: N/A
Date Start/Finish: 6/29/06,6/29/06
Hole Diameter (in):

Depth (ft)	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Weathered Transitional Beds Brush cover, dry to moist, dark brown, silty fine SAND; rootlets present (SM).					
				Becomes brown at 2 feet.					
		S-1		Gravel layer at 2.5 feet. Same with fine to coarse gravel.			2 2 2	▲4	
5		S-2		Same, no roots.			4 5 5	▲10	
		S-3		Same. Hard drilling at 7.5 feet; refusal at 75. feet. Moved drill 20 feet to west, refusal at 7.5 feet. Moved drill 5 feet to southeast, refusal at 10 feet. Driller says refusal may be due to gravel layer.			12 15 11	▲26	
10		S-4		Same.			11 18 16	▲34	
				Bottom of exploration boring at 11.5 feet Exploration terminated due to refusal					
15									
20									
25									
30									
35									

Sampler Type (ST):
- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample
- M - Moisture
- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: SKL
Approved by:

AESIBOR 060432A.GPJ July 26, 2006

SW 1/4, SEC.36, TWN.25N, RGE. 5E, W.M.

CONCEPTUAL MITIGATION PLAN

KAMOH RESIDENCE

439 West Lake Sammamish Parkway SE

TEMPORARY DISTURBANCE RESTORATION AREA:

= TEMPORARY DISTURBANCE RESTORATION AREA

TEMPORARY DISTURBANCE RESTORATION AREA NOTES:

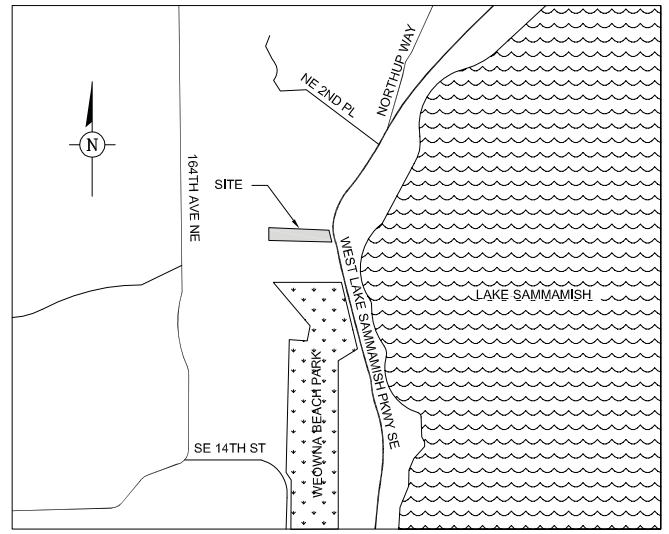
1. AREA TO BE RESTORED TO PREDEVELOPED CONDITIONS.
2. THE CONDITION OF THE AREAS OF TEMPORARY DISTURBANCE EXISTING PRIOR TO UNDERTAKING ANY DEVELOPMENT ACTIVITY SHALL BE DOCUMENTED WITH THE FINAL LANDSCAPE PLAN.

LARGE WOODY DEBRIS SPECIFICATIONS

LOG SPECIFICATIONS	#LOGS
LOG & ROOTWAD (>12" DBH; 10'-15' LENGTH WITH ROOTBALL)	34%
LOG (8" - 12" DBH; 10' - 15' LENGTH W/O ROOTBALL)	33%
LOG (4" - 8" DBH, > 6' LENGTH W/O ROOTBALL)	33%

LARGE WOODY DEBRIS NOTES

1. LOGS AND ROOTWADS SHALL CONSIST OF PARTS OF TREES ACTUALLY REMOVED FROM THE PROPERTY.
2. LIMBS SHALL BE MAINTAINED ON STEMS TO GREATEST EXTENT PRACTICAL.
3. ROOT WADS SHALL HAVE RELATIVELY EVEN SPREAD OF ROOTS WITH MINIMUM ROOTBALL DIAMETER OF FOUR FEET. EXCESS DIRT SHALL BE SHAKEN OFF PRIOR TO PLACEMENT.
4. ALL LOGS SHALL BE PLACED BY EQUIPMENT OPERATING OUTSIDE OF THE ORDINARY HIGH WATER.
5. LOGS SHALL BE PLACED AT WATERS EDGE AT AND BELOW ORDINARY HIGH WATER MARK.
6. EXACT LOG PLACEMENT AND GROUPING SIZE SHALL BE FIELD ADJUSTED BY A BIOLOGIST REPRESENTING WDFW OR THE APPLICANT DURING PLACEMENT.
7. LOGS SHALL NOT BE ANCHORED BUT SHALL BE PLACED TO PROVIDE NATURAL RESISTANCE TO MOVEMENT.



PLANTING SCHEDULE

= RIPARIAN ENHANCEMENT AREA

SPECIES	SIZE	FINAL BUFFER DENSITY	FINAL COUNT
TREES ● WESTERN RED CEDAR (THUJA PLICATA) ⊕ WESTERN HEMLOCK (TSUGA HETEROPHYLLA) ✳ DOUGLAS FIR (PSEUDOTSUGA MENZIESII)	MINIMUM 4FT TO 6FT HEIGHT	0.01 TREES / SQ.FT.	MINIMUM 12 TREES (3:1 REPLANT RATIO), FINAL COUNT T.B.D.
LARGER SHRUBS (RED-OSIER DOGWOOD, VINE MAPLE, SALMON BERRY, NOOTKA ROSE, HAZELNUT)	2 GALLON	0.05 PLANTS / SQ.FT.	T.B.D.
SMALLER SHRUBS (SWORD FERN, SALAL, SNOWBERRY, OREGON GRAPE, DEER FERN)	1 GALLON	0.05 PLANTS / SQ.FT.	T.B.D.

PLANTING NOTES

1. PRIOR TO PLANTING, THE SITE SHALL BE SURVEYED AND FINAL COUNT AND SPECIES DETERMINED TO MEET SPECIFIC SITE GROWING CONDITIONS.
2. MINIMUM FINAL BUFFER DENSITY WILL INCLUDE EXISTING PLANTS PLUS THOSE TO BE ADDED.

GRAPHIC SCALE

40 0 20 40

SCALE IN FEET

CONCEPTUAL HOUSE LAYOUT - FINAL HOUSE DESIGN WILL NOT EXCEED BOUNDS SHOWN HERE