

Spring 2011

Environmental impact assessment: Smith Gardens slope stabilization and long plat applications

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Environmental Impact Assessment

Smith Gardens Slope Stabilization and Long Plat Applications



Huxley College of the Environment
Western Washington University
Spring 2011

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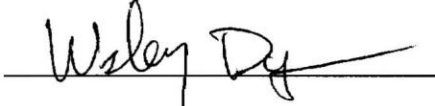





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June 3, 2011

Environmental Impact Assessment

Smith Gardens Slope Stabilization and Long Plat Applications

Prepared By:

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Environmental Studies 436
Professor Jean Melious
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Spring 2011

This report was prepared for educational purposes in ESTU 436 at Western Washington University's Huxley College of the Environment. The content of this report was not created for official government or private use involved with the Smith Gardens Project. The intent is to actively participate in the process of create an EIS in an academic setting.

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1.0 CONCERNED CITIZENS LETTER

June 3, 2011

Dear Concerned Citizens:

Enclosed you will find the Environmental Impact Assessment (EIA) compiled in accordance with the State Environmental Policy Act (SEPA, WAC 197-11), which examines the implications of the Smith Gardens Bellingham Farm proposal for a slope stabilization as well as a long plat application for 15 new lots at 1265 Marine Drive Bellingham, WA 98225. This EIA will specifically focus on the impacts of these two projects as one proposal.

Under the supervision of Professor Jean Melious, this EIA was created for academic purposes by students at Western Washington University completing the capstone course, Environmental Studies 436-Environmental Impact Assessment, and displays our abilities to examine the effects of two proposals on the natural and built environment in Whatcom County. Additionally, it will assess impacts of an alternative proposal devised by the project team, and if no action is taken. Through compiling information on each proposal, the EIA team would like to advise the implementation of the project alternative action.

Through reading this EIA on the impacts of the proposed Smith Gardens slope and housing applications, it is the EIA team's hope that the reader will have a better understanding of the impacts that each action will have on both the natural and built environment.

Sincerely,

The Smith Gardens EIA Project Team

2.0 FACT SHEET

Project Name: Smith Gardens

Project Description: Smith Gardens, Inc is a supplier of garden products in the northwest. Operating as a family-owned business, owned by Terry and Carolyn Smith, the company has been functioning for over 100 years. The site (1265 Marine Drive) is located just outside the Urban Growth Area of Bellingham and is over 15 acres. There are two applications for this property: (1) a proposal to subdivide the parcel and build 15 new houses, and (2) to stabilize the bluff near Bellingham Bay, which is at the south tip of the property.

Legal Description of Location: 1265 Marine Drive Bellingham, WA 98225
Tax Parcel Number: 380215-042190
Fire District 8 / Water District 2
Property is located outside UGA
Zoning: RR1 (Rural Residential-1 unit per acre)

Proposer: Terry & Carolyn Smith
3884 Fort Bellingham Road
Bellingham, WA 98225

Lead Agency: EIA Smith Gardens Project Group
Western Washington University
516 High Street
Bellingham, WA 98225

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Acknowledgments: The EIA contributors would like to thank the following people for their assistance and cooperation:
 Jean Melious, Professor, Western Washington University
 Laura Chandler, Neighbor to Smith Gardens Site

Issue Date: June 3, 2011

Presentation Time and Date: Friday, June 3, 2011 at 11:30am
 Western Washington University
 Academic West, Room 302 (AW 302)

Permits:

Permit Name (include source of permit requirements)	Trigger/Activity	Contact Agency
Federal		
(none)	(none)	(none)
State		
DOE NPDES Construction General Permit	Construction site operators are required to be covered by a Construction Storm water General Permit if they are engaged in clearing, grading, and excavating activities that disturb one or more acres and discharge storm water to surface waters of the state	Whatcom County 5280 Northwest Drive Bellingham, Washington 98226
Local		
Whatcom County Shoreline Substantial Development Permit	A permit is required for substantial and large shoreline development	Whatcom County 5280 Northwest Drive Bellingham, Washington 98226
Fill and Grade/Land Disturbance Permit	Any fill, grade, or clearing within 30 feet of a critical area requires review and approval from Whatcom County.	Whatcom County 5280 Northwest Drive Bellingham, Washington 98226
Land Disturbance Permit	Any fill or grade in excess of 50 cubic yards requires a land disturbance permit	Whatcom County 5280 Northwest Drive Bellingham, Washington 98226

Figure 1- Permit Chart

Smith Gardens Bellingham WA






Author: Corey Holloran Date: 5/10/11 Data: WWU database and Bing Maps

Figure 2- Existing Conditions

Smith Gardens Proposed Action



Legend
 Proposed Lots
 Access Road
 Fort Bellingham Road
Requirements
-Widening of Fort Bellingham Road
-Enlarged Septic Tank
-Stabilizing of Bluff
-Removal of Native Vegetation

Data: WWU database and Bing maps

Author: Corey Holoran Date: 5/15/11 Projection: NAD_1984

Figure 3- Project Proposal

Smith Gardens Preferred Project Alternative



Smith Gardens Site



Legend

 Proposed Lots

 Access Road

 Fort Bellingham Road

Requirements

- No widening of Fort Bellingham Road
- Single family use septic tanks
- No stabilizing of bluff
- No removal of native vegetation

Data: WWJ database and Bing maps

Author: Corey Holloran Date: 5/15/11 Projection: NAD 1984

Figure 4- Project Alternative

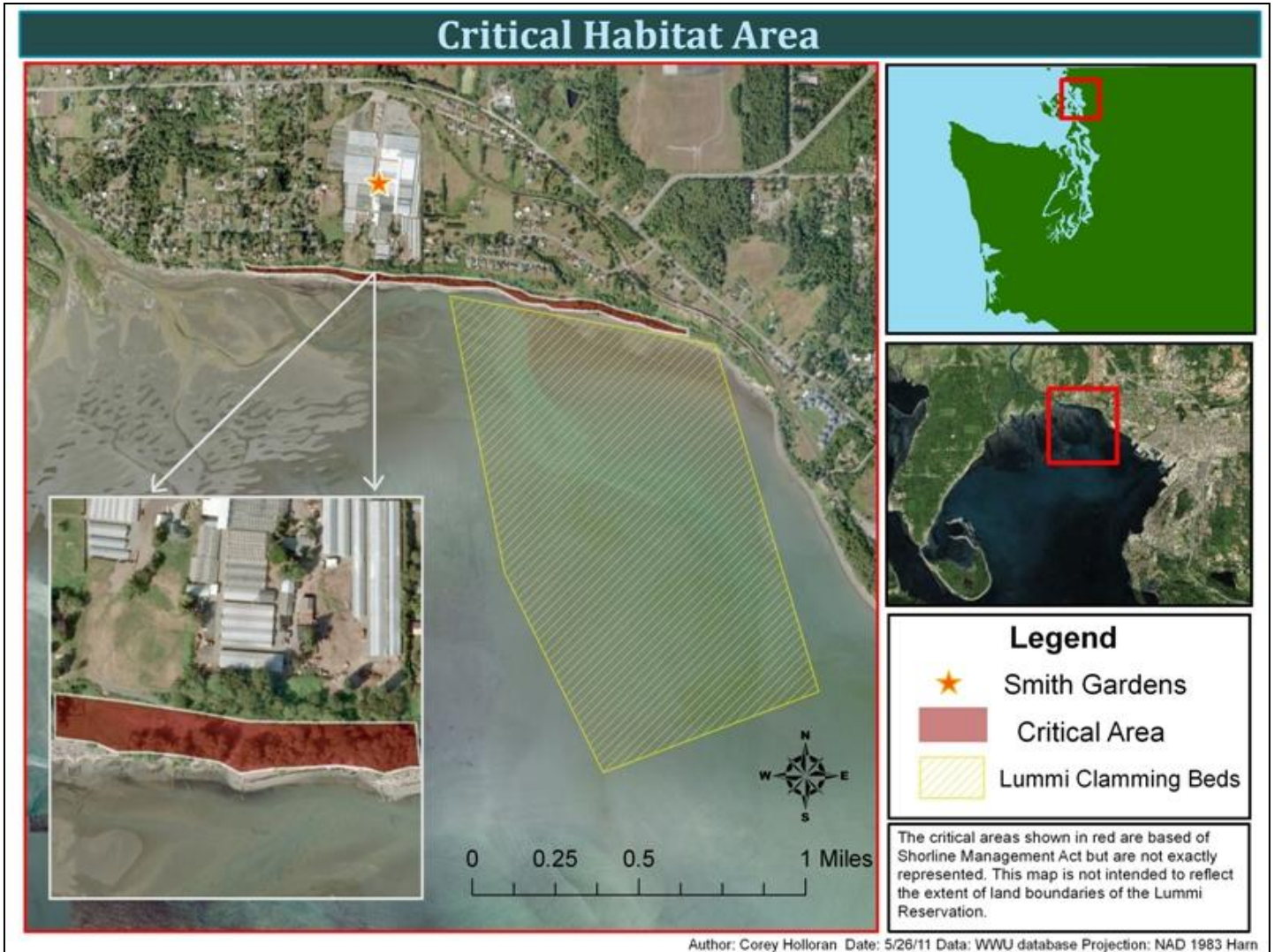


Figure 5- Critical Habitat Area

3.0 BACKGROUND INFORMATION

The Washington State Environmental Policy Act (SEPA) “requires state and local agencies to consider the likely environmental consequences of a proposal before approving or denying the proposal.” Such proposals can include private projects, constructing public facilities, or adopting regulations, policies, or plans. An environmental checklist is completed first, which focuses on specifics of the proposal and how it will affect the environment.

Each project receives a significance rating. The significance is based on the physical setting and the project magnitude and duration. If the environmental checklist shows likely significant impacts, a determination of significance (DS) is given, while a determination of non-significant (DNS) is given to proposals without large environmental impacts. If it is decided that the proposal could have significant adverse effects on the environment, a detailed Environmental Impact Statement (EIS) must be prepared. The EIS is used to analyze and assess the likely significant adverse environmental impacts and possible mitigation measures. The Smith Gardens Project is considered to have a DS.

This project is located in Whatcom County, just outside of Bellingham, Washington. Whatcom County is in the northwest corner of Washington State, with Canada bordering to the north. Bellingham, at approximately 28 square miles, is the largest city in Whatcom County, and about 90 miles north of Seattle and 21 miles south of the Canadian border. Smith Gardens is located east of the Nooksack River and is situated just north of Bellingham Bay.



Figure 6- General Location

 Smith Gardens Site Location

Smith Gardens, Inc is a supplier of garden products in the northwest. Operating as a family-owned business (owned by Terry and Carolyn Smith), the company has been functioning for over 100 years. The site has several greenhouses, employs over 600 people in peak season and carries over 300 varieties of plants.

Harry Smith first acquired what is now the 35-acre Smith Garden lot in 1901. Immediately, the Smith family started clearing, tilling, and preparing the land for vegetable gardens. It wasn't until about approximately 40 years later that the Smiths realized that producing flowers would make more of a profit than vegetables. Greenhouses were built and the company still continues to be run by the Smith Family.



Figure 7- Employee in Greenhouse

4.0 EXECUTIVE SUMMARY

4.1 Objective

The Smith Gardens Property has two applications in process — a long plat application to subdivide for 15 lots, and a bluff stabilization application. Smith Gardens has claimed that the bluff stabilization is necessary to ensure the safety of its employees working in the greenhouses near the slope; however, if the long plat application is approved, the greenhouses close to the bluff will be removed and replaced with new houses. Smith Gardens, Inc. is sponsoring the bluff stabilization and Harry Smith Family, LLC is proposing the long plat. Although these two applications have been approved to be considered by the county separately, this Environmental Impact Assessment is treating them both as one proposal.

4.2 Proposal and Alternative Summary

The applicant is seeking to subdivide 15.16 acres of its property into 15 residential units (about .37 - .99 acres per unit) with two reserve tracts, which are open parcels of land set aside for specified purposes. The applicant is also seeking to stabilize the nearby bluff to ensure the safety of the residences and to mitigate partially the impacts of the subdivision on the bluff. The alternative the proposal is to build 5 new houses, opposed to 15. These lots would be set back as far as possible with native vegetation either remaining in place or being added to areas on or nearby the bluff. This would eliminate the need to re-stabilize the bluff. The need to widen Fort Bellingham Road would also be eliminated since subdivisions of less than 5 houses do not require expanded traffic access under Whatcom County Code. Additionally, 5 lots would allow each lot to have its own private septic system. The last option would be to not through with the proposed project. This means the property would not be subdivided and the bluff stabilization would not be done.

4.3 Impacts and Mitigated Measures Summary

Because this project involves bluff stabilization, constructing residential homes, and widening Fort Bellingham Road, there are concerns relating to the impacts of erosion, runoff, and shoreline conservation. The applicant has proposed a few mitigatory measures in their environmental checklists:

- Best Management Practices (BMPs) for erosion and sediment control, consistent with DOE Storm Water Manual for Western Washington
- BMPs to meet Whatcom County development standards and to manage runoff on-site
- Preserve and enhance the vegetation within the 200-foot shoreline buffer
- Using the International Building Code for energy-efficient buildings
- “Plans are submitted to mitigate for traffic impacts”

The applicant has not provided any additional mitigative actions for the noise or emissions generated by the project, nor any for housing impacts (noise, light, e.g.).

5.0 PROPOSAL AND ALTERNATIVES

5.1 Proposed Project

Though the long plat and bluff stabilization projects are in actuality being considered separately, for the purposes of this document they are being treated as one proposal (“the proposal”, “the project”); this is to ensure compliance with the State Environmental Protection Act. With this in mind, the objective of the proposed project is to build 15 new single-family homes, presumably because this would yield more money than maintaining and continuing nursery operations. The shoreline stabilization project is a necessary supplement to the long plat because the bluff would need to be stabilized in order for the homes to be safe for living in, as this area is a geologically hazardous area.

The applicant is seeking to subdivide 15.16 acres of its property into 15 residential units (about .37 - .99 acres per unit) with two reserve tracts, which are open parcels of land set aside for specified purposes. The applicant is also seeking to stabilize the nearby bluff to ensure the safety of the residences and to mitigate partially the impacts of the subdivision on the bluff. For the bluff stabilization, the applicant proposes inserting 85-foot deep, 2-foot diameter piles in the eastern portion of the site; regarding the slope of the middle portion to 13 degrees (and thereby removing nearby greenhouses); and raising the western portion approximately 15 feet by compacting the excavated material from the middle portion. The long plat is for the southern portion of the Smith Gardens property, and the proposed subdivision is illustrated below:



Figure 8- Proposed Parcel Map of New Lots

The first reserve tract (“Tract A Reserve”) is the bluff and critical areas therein, and the second reserve tract (“Tract B Reserve”) is for the on-sight septic system. The on-sight septic system is proposed to be approximately one acre and would contain about 38,500 square feet of septic basins and drain fields. This septic system would be designed for flows of 5,760 gallons per day, and would be broken into three parcels, each less than 3,500 gallons per day so as to avoid having the septic system under the State Department of Health’s jurisdiction.

The bluff stabilization work would be done first, since it is necessary for the homes. The subdivision is proposed to occur in four phases. Phase 1 includes lots 1, 2, 13, 14, and 15, and the applicant hoped to begin this phase by spring 2011 (this will not be the case, however, as none of their permits have been granted at this point). Phase 2 includes lots 9, 10, 11, and 12; Phase 3 includes lots 6, 7, and 8; and Phase 4 includes lots 3, 4, and 5. The project also includes plans for a turnaround and a small boat shed within the 200-foot shoreline buffer. Once started, the applicant plans to have the entire project completed within 10 years.

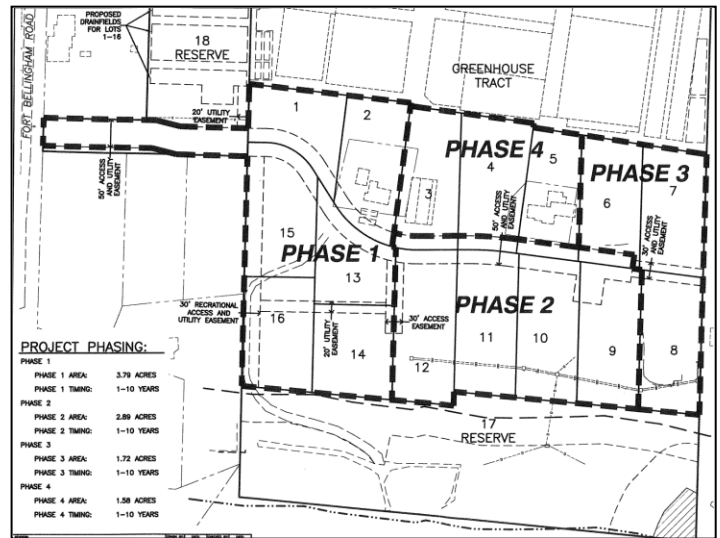


Figure 9- Proposed Project Phasing
 (Note: This phasing map was for the original subdivision, which consisted of 16 lots; the proposal has since been changed to 15 lots, with lots 6 and 7 being combined.)

Because 15 new lots are proposed, the main access road—Fort Bellingham Road—would have to be widened to accommodate the significant increase in traffic. A private road providing access to the residential units will also be constructed. According to the long plat environmental checklist, the private road will be constructed in two phases, with “the first phase extending from the plat access on Ft Bellingham Road to the east property line of proposed lot 11.” (For road widening plans, see Appendix D)

5.2 Project Alternative

An alternative to the proposed project would be to reduce the subdivision to five long lots. The houses would be built as far back as possible, with native vegetation either remaining in place or being added to the areas on or nearby the bluff. This would eliminate the need for a bluff stabilization project while still building some houses near the bluff. A five-lot subdivision would also eliminate the need to widen Fort Bellingham Road, since subdivisions of less than five houses do not require expanded traffic access under Whatcom County Code. Additionally, five lots would allow each lot to have its own private septic system. The private road providing access to the residential units would still be required. The proposed mitigatory measures listed above for the project would still apply, to the extent necessary.



Figure 10- Close-up of Project Alternative

5.3 No Action

The final option would be to not go through with the proposed project. In this alternative, the property would not be subdivided and the bluff stabilization would not be done. Any of the greenhouses on the bluff that are in serious danger of damage by landslides may have to be removed; otherwise the property would remain as is.

5.4 Preferred Action

Through this environmental impact assessment, a preferred action has been chosen: the project alternative. Given that the applicant has not supplied a compelling purpose for undertaking the proposed project, and given that the proposed project is not in compliance with all existing laws, the project alternative was chosen as the preferred action. Furthermore, the alternative has been found to have significantly less adverse environmental impacts than the proposed project, and may even provide some environmental benefits, such as preserving and expanding native vegetation.

6.0 ELEMENTS OF THE NATURAL ENVIRONMENT

6.1 Earth

Geology and Topography

Existing Conditions

The site is located on the northern coastline of Bellingham Bay directly east of the Nooksack River outlet and north of the city of Bellingham. Bellingham Bay is a relatively large embayment located in the eastern part of Puget Sound-Georgia Strait complex. The Puget Sound Basin drains west from the north and west sides of volcanically active Mount Baker and meets the sea at Bellingham Bay near the southern end of the Strait of Georgia.

Two rivers, the Nooksack and the Samish, flow into Bellingham Bay from the north and the south and have relatively large deltas. The Nooksack River channel undergoes a steady decline in gradient, diminishing 100-fold over the 56 river miles from its upper end in the North Fork to the river mouth. Dramatic topographic relief of the region is the result of tectonic activity along the Cascadia Subduction Zone. Pleistocene glaciation sculpted distinct valley morphologies in different parts of the area. These Pleistocene continental and alpine glaciations shaped and scoured the region, modifying topography and mantling many areas with deposits of tills, outwash and glaciomarine drift. Historically, the greater Nooksack delta (including the Lummi and Nooksack rivers) included extensive estuarine and riverine-tidal freshwater wetlands.

In the lower river, upstream of Ferndale and downstream of Everson, the valley is broad and is inset within gently rolling hills underlain by glacial sediments. This broad, gently sloping valley is presumed to have resulted from the erosional effects of continental ice that entered the lower Nooksack through the Sumas River valley.

Upstream of Everson and downstream of the forks, the valley is steeper and narrower. The upper and lower mainstem reaches also have different valley cross-sections. In the lower mainstem, riverbanks and natural levees are higher than the surrounding floodplain, which drops in elevation with distance from the channel. In the upper mainstem, by contrast, the valley bottom does not occur systematically with distance across the valley, but is associated with current or former channels, sloughs, and forested islands.

The river gradient continues to steepen in the North Fork at a rate similar to the upper mainstem, while the Middle Fork steepens more rapidly and the South Fork less so. The topography of the northern end of the bay is low and flat and extends inland as lowlands. These lowlands (the Nooksack River Valley) are covered with a mantle of marine silts and clays, various types of glacial deposits, and alluvium mostly derived from reworked glacial material.

The soil on the site itself generally consists of silty loams which formed from parent materials of volcanic ash, loess, glaciofluvial deposits, and glaciomarine drift. The area is located on a gently sloping terrace; in the south, the property slopes to a band of beach terraces approximately 100 feet wide. The bluff is influenced by the freshwater flow from the Nooksack River as well as some unnatural processes, such as a potential history of unmonitored dumping and the

accumulation of nursery debris. The bluff itself is categorized as an Active Landslide Hazard Area by Whatcom County.

Soils and Erosion

Existing Conditions

According to the USDA Soil Survey of Whatcom County, the area consists of 5 different types of soil: Tromp loam, Whatcom silt loam 0-3 percent slope, Whatcom silt loam 30-60 percent slope, Whatcom Labounty silt loams 0-8 percent slope, and Whitehorn silt loam. All of these native soils are derived from common parent materials, including volcanic ash, loess, glaciomarine drift and glaciofluvial deposits. The soil of interest for the bluff stabilization is the Whatcom silt loam 30-60 percent slope; on site, however, this is mixed with non-native soils that have been deposited in the area. Whatcom silt loam 30-60 percent slope is a moderately well-drained soil found on the foothill back slopes. Its permeability is moderate in the upper part of the soil and slow in the lower part, and it has a high water capacity. This soil is listed as having medium runoff with a moderate hazard of water erosion. The non-native soil deposited in this area is a miscellaneous collection of nursery waste and debris that includes potting soil, plastic plant tags, plastic pots, clay pots, and other various items. Some of this non-native soil has been deposited here through outwash and wind, while some of this material may have made its way here through a history of dumping. The Department of Ecology issued a Notice of Correction after the reported dumping of “rubble, wood, soil, gravel and other miscellaneous debris onto the Bellingham Bay shoreline.” The exposed scarp plane displayed an upper layer of brown sand with gravel that is likely uncontrolled fill, approximately 10-foot thick plastic wrapping, and bricks and construction debris as well as several layers of clay overlaying a mix of clay and potting soil with various degrees and amounts of trash associated with a commercial nursery (terra cotta, pot fragments, plant tags, plastic pots, e.g.).



Figure 11- Soils and Smith Garden Area

The bluff is moderately vegetated with trees and shrubs as well as areas of grass and meadows. It is part of a dynamic system of erosion and deposition. According to the Stratum Group Report, the bluff is unstable; landslides, erosion, and soil creep should be expected on this bluff as a part of the ongoing natural process. This opinion is supported by Whatcom County’s designation of the area as an Active Landslide Hazard Area. A review of past and present aerial photos also show that this area acts as a feeder bluff and is therefore critical to the health of surrounding beaches.

Proposed Project

Heavy machinery will need to be used in the re-grading of the slope, the installation of the stabilizing cast-in-place pilings, the construction of the houses, installation of septic and storm water systems, and the widening of the Fort Bellingham Road. The use of heavy machinery on these slopes can overload the slopes and cause potential landslides and a potentially high rate of erosion. The use of this heavy machinery will also compact the soil, which will adversely affect any future growth of vegetation in the area. Additionally, the proposed re-grading of the slope will involve the transport of material from different points on the site for use as filler. This would include approximately 8,000-9,000 cubic yards from outside the shoreline district and approximately 3,700 cubic yards from inside the shoreline district. The proposed cast-in-place piles will be 85 feet deep and will involve extensive digging and construction, which will cause vibrations and potentially high rates of erosion on the site as well as on neighboring sites (neighbors have complained of significant vibrations from past construction).

The filling and compaction will be soil from on-site sources and may include soil that is not truly native (described in previous section). The effects of using non-native soil may have adverse impacts that are presently unknown. Re-grading the slopes and installing the engineered cast-in-place pilings will mean extensive clearing and excavating, which will lead to loose soil conditions, further erosion, and the loss of a current natural defense against erosion. Excess erosion into the bay will result in the degradation of the land itself, potential eutrophic conditions in the bay, and potential adverse effects on aquatic species such as plants, macro-invertebrates, and fish.

The actual stabilization of the bluff will also have adverse effects on the neighboring shoreline. According to the Stratum Group Report, “engineered efforts to stabilize the bluff through artificial means would also have the undesirable effect of inhibiting the natural erosion process and therefore should be avoided. Feeder bluffs are essential to maintaining shoreline processes because they provide sediment to beaches as the bluff is eroded. Prevention of feeder bluff erosion through bluff stabilization measures can cause significant damage to other shoreline properties dependent upon the supply of sediment from the feeder bluffs.”

Mitigation Measures

Best Management Practices (BMPs) will be employed for the mitigation of soil erosion. BMPs are designed to reduce the impact on water quality, plants, animals, and other resources from development. This reduced reduces and minimizes exposure to risks such as erosion, flooding, and landslides. BMPs for this site include the use of silt fences, straw barriers, hydro-seeding, and geo-textile fabric used as a mat to protect slopes during construction.

Along with the BMP's, a large part of controlling erosion will be the implication of an effective stormwater system. Smith Farms is planning to install a 12-inch storm drain at the foot of the new embankment, a 230-linear-foot and 12-foot deep storm water interceptor trench, and a 540-linear-foot and 2-foot deep French drain system. These systems will help against not only general erosion but also against the threat of landslides, which, in this area, are generally caused by the movement of water on the bluff.

Recommended Voluntary Mitigation

There are other ways of successfully mitigating erosion patterns. The construction of an artificial wetland before bluff stabilization begins would be an effective way of removing a large amount of the total suspended solids in the stormwater as well as any large nutrient loads. The use of compost during and after construction as a mulch is an effective aide for rebuilding the soil and will help with soil compaction and the regulation of erosion. After construction, the restoration of native plants wherever possible would be preferable in order to try to replace as much destroyed habitat as possible.

Project Alternative

Under the project alternative proposal, the five new houses would be further away from the bluff, meaning a bluff stabilization would not be needed. The existing vegetation would stay and act as a buffer to reduce the amount of erosion that goes on during the more-limited construction.

No Action

Under the no action alternative, the bluff would stay in its current state. With the bluff in its current condition, Smith Gardens would have to remove the greenhouse that is closest to the bluff because of landslide risk. Keeping the bluff un-stabilized will allow it to function as a feeder bluff. Any native plant restoration and avoidance of vegetation removal should be enough to regulate erosion. Water practices will need continued supervision in the defense against potential landslides caused by runoff.

6.2 Water

Surface Water:

Wetland

Existing Conditions

The wetland on the Smith Gardens property is located in the southeast corner of the property. It is a Category III wetland, and is approximately 5,130 square feet in the area on-site. The conditions, regulations and extent of the wetland were determined by Cantrell & Associates using techniques outlined in the U.S. Army Corps of Engineers Wetland Delineation Manual and Washington State Department of Ecology Wetlands Identification and Delineation Manual. The wetland is a flow-through, palustrine, depression, forested wetland with seasonal saturation. The water appears to drain freely into Bellingham Bay through sandy beach soils. The wetland does not mitigate flooding and is not associated with a stream. Using Washington State Wetland Rating System for Western Washington, this wetland scored a Category III, with very low Hydrologic Functions, low Water Quality Functions and low Habitat Functions. It is a High Intensity Land Use wetland that requires an 80-foot buffer.

Prior to the landslide in 2009, neighbors observed the size of the wetland to be much larger than its current size. Tidal flow has also been observed in the wetland. The denotation of low habitat function has been disputed; however no third party has been required to study the conditions of the wetland.

Proposed Project

The proposed action will be able to follow the regulation of an 80-foot buffer; there is no intention of any fill entering the wetland for neither the bluff stabilization nor the long plat. However, it is unlikely that this wetland will not be negatively impacted by the construction through the movement of soils and building of houses. If the wetland were to grow at all, as the site was measured in the summer when the wetland was not at its peak, then the development could infringe upon the wetland disrupting any of its already impaired habitat functions. Stabilizing the bluff will cause disruption and movement of soils around the wetland. While the plan indicates that no fill will be added, surrounding vegetation will be removed, reducing the amount of plants that aid in filtration of groundwater and surface water runoff. This increases the amount of nutrients, particulates, and volume of water that will enter the wetland, which could degrade the health of the wetland. To mitigate this impact, a buffer of more than 80 feet should be implemented. A second artificial wetland should also be developed to filter water from nursery operations and stormwater runoff.

Project Alternative

The project alternative will eliminate encroachment on the wetland, as there will only be five developments. This allows for the wetland to have a much greater buffer, and could potentially allow the wetland to grow and enhance some of its habitat functions. The bluff would not need to be stabilized and consequently the area will not be severely disturbed and vegetation will not be removed. Placement of septic tanks and drainage from the five units should be placed carefully on the property to ensure that the runoff will not be directed into the wetland.

No Action

No-action will not affect the wetland; it will also allow the wetland to have a large buffer.

Stormwater Runoff

Smith Garden Property

Existing Conditions

All stormwater runoff, both off-site and on-site, and with no delineation between irrigation and precipitation from stormwater, is drained through a system of pipes with two outfalls. One outfall, 24 inches wide, is on the southwest side of the property and spills onto their neighbor's property. The other outfall discharges at the southeast side of the property directly into Bellingham Bay and is 22 inches wide. Pollution has been noted to discharge through these pipes, including plastic, rubber gloves, and fertilizer pellets as well as high levels of phosphates, nitrates, and various chemicals. There is an interceptor trench present along the bottom of the slope for slope stabilization. There are currently no means of treating the waste water from the Smith Garden nursery operations.



Figure 12- Outfall on Site

Proposed Project

The development of 15 units on the Smith Gardens property will actually decrease the amount of impervious surfaces present on the property. The proposed decrease will be from 1,045,440 square feet to 891,940 square feet, decreasing the overall amount of stormwater runoff. To deal with stormwater runoff Smith Gardens intends on improving the existing drainage systems by routing off site drainage and some greenhouse roof drainage in a separate pipe to the existing outfall dissipation on the southwest side of the property. Also, precipitation water will be separated from irrigation water and directed into that same outfall. These sources of water will not be treated. Irrigation water will be held in bio-retention swales. Bio-retention rain gardens will be used near the gravel parking lot to treat water from the access ways and parking lot for the nursery operations. Separating and treating water from irrigation will reduce the amount of pollution and nutrients added to stormwater runoff. Additional bioswales will also allow the stormwater to filter out much of the nutrients and pollution as well.

Project Alternative

With a smaller degree of construction, the amount of impervious surfaces will be lower than the figure seen under proposed action. This will further decrease the amount of stormwater runoff. However the runoff from the greenhouses will still need to be dealt with. (See no-action)

No Action

Without any modifications to the bluff or any construction, stormwater runoff is still an issue. Smith Gardens intends on improving stormwater runoff treatment. The existing conditions have all runoff going to two outfalls into the tidelands of Bellingham Bay. Regardless of the long plat and bluff stabilization, the plans to build rain gardens and to redirect and separate runoff from the nursery should be implemented. The runoff from nursery operations should be treated with bioswales, and an artificial wetland should be built to aid in treating runoff from nursery operations and stormwater before it enters Bellingham Bay or the wetland.

Fort Bellingham Road

Existing Conditions

Alongside Fort Bellingham Road there are several ditches to capture and treat the stormwater runoff. The existing ditches would need to be reseeded in order to meet water quality treatment standards by the Department of the Ecology.

Proposed Project

Fort Bellingham Road will be widened, a water main will be installed, and a new road to access the subdivision will be constructed. In order to deal with the excess stormwater runoff from an expanded Fort Bellingham Road, Smith Gardens intends on making the existing ditches larger and deeper in addition to installing several more ditches. Another mitigation effort would be to plant bioswale grass seed in all of the ditches and reseed the existing ditches. These ditches would then accommodate for the excess water runoff from an increase in impervious surfaces through more and larger ditches. Reseeding with bioswale grass would improve water quality treatment before the water runs out into Bellingham Bay.

Project Alternative

With the addition of only five houses, Fort Bellingham Road would not need to be widened. However, the treatment of stormwater runoff from the road should still be improved by planting bioswale grass seed to increase the ability of the existing ditches to treat water quality.

No Action

Through no action, the road would not need to be widened and the amount of impervious surfaces would not be increased; the amount of storm water runoff would remain at present levels. The treatment of storm water runoff from the road should still be improved by planting bioswale grass seed to increase the ability of the existing ditches to treat water quality.

Groundwater Runoff: Septic

Existing Conditions

The existing three households on the Smith Gardens property all have individual septic tanks. There has been evidence of leaking septic tanks in the area in the form of high levels of fecal coliform found at outfall #1 on the southwest side of the property. These three septic tanks at peak nursery operations handle the waste of 130 employees.

Proposed Project

In order to handle the sewage created by 15 more units, a community sewer will be installed along with a private drain field. Sewage will be transferred from the residences through pipes in a gravity sewer system, which flows to a community pump station, and then the sewage enters a septic force main which expels the sewage into a drain field area for disposal. The community drain field would be a 38,500 square-foot parcel buried a few feet below the surface. The septic tank would be split into three parcels on a one acre plot. By breaking the tank into three parcels, the sewer would avoid state regulations for septic systems handling flows over 3,500 gallons per day at a common point. The proposed septic system would handle the effluent of 5,760 gallons per day, split into three parcels in the tank. Runoff from the septic tank and drain field would drain through groundwater toward neighbors' properties, onto the shoreline and into Bellingham Bay or to the wetland. This would increase the amount of effluent containing nutrients into Bellingham Bay or the wetland, which could cause algal blooms. Algal blooms could result in eutrophication, leading to oxygen-poor conditions that are fatal to organisms. In order to better regulate the amount of sewage and drainage, the system should be under state regulations for the amount of flow this entire system would receive. Stricter regulations would help to control the amount of drainage entering the groundwater. Additional bioswales or an artificial wetland could be installed to aid in additional filtration.

Project Alternative

With the project alternative, each unit would be able to have its own septic tanks. This falls within county regulations, eliminating the need for a community drain field and pump. Less sewage in the area will have a smaller impact on the surrounding environment due to fewer effluents that could enter the groundwater flowing into Bellingham Bay. Effluents contain nutrients such as nitrogen; a severe increase in nitrogen could alter the growth of algae in surrounding water bodies, including the wetland on the property and Bellingham Bay. An algae bloom could lead to eutrophication and hypoxia, creating fatal conditions for certain fish populations. If there is less sewage, then the amount of nutrients entering the groundwater is

reduced. The positioning of five individual septic tanks will also decrease the amount and change the direction of drainage allowing more time for the septic drainage to be filtered by the soils. More bioswales could be implemented to filter out nutrients from the septic tanks drainage.

No Action

With no action, the existing septic tanks should be replaced in order to prevent leaks. This would reduce the amount of fecal coliform found in the groundwater at outfall #1.

6.3 Plants & Animals

The Smith Gardens nursery is about 200 feet uphill from Bellingham Bay and is in very close proximity to where the Nooksack River drains into the Bay. This delta and estuarine environment is very important to a wide range of plant and animal species, several of which are severely declining in population.

Plant Species and Diversity

Existing Conditions

In the existing environment, coniferous and deciduous trees are the dominant native vegetation. Willows of the genus *Salix*, alders of the genus *Alnus*, black cottonwood (*Populus trichocarpa*), Douglas fir (*Pseudotsuga menziesii*), and Western red cedar (*Thuja plicata*) are typical species found along the Nooksack (WNPS, 2006), all of which remain present on the bluff below Smith Gardens. The understory is composed of a variety of species, including vine maple (*Acer circinatum*), salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*), Indian plum (*Oemleria cerasiformis*), Scouler willow (*Salix scouleriana*), sword fern (*Polystichum munitum*), and bracken fern (*Pteridium aquilinum*).

This area has come to support non-native understory species as well, especially Himalayan blackberry (*Rubus armeniacus*). Other non-natives that are also quickly spreading are Canada thistle (*Cirsium arvense*), poison hemlock (*Conium maculatum*), and crack willow (*Salix fragilis*). Shoreline restoration repair took place in 2009 after a landslide, and native plants were planted to facilitate the restoration of native vegetation. In the small wetland east of where the landslide occurred, there are wetland plants, including common cattail (*Typha latifolia*) and oak fern (*Gymnocarpium dryopteris*).



Figure 13- Invasive Species on Site

Unique Species of Animals

Existing Conditions

The Nooksack River is important habitat and spawning grounds to many species of fish, including those of the family salmonidae. Anadromous salmon in the Nooksack include chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye (*O. nerka*), pink (*O. gorbuscha*), and

chum (*O. keta*.) (NMFS, 2010). Other diadromous fish include steelhead and resident rainbow trout (*O. mykiss*), bull trout (*Salvelinus confluentus*), and cutthroat trout (*O. clarki*). Of these species, Chinook salmon were listed as a threatened species (and an Evolutionarily Significant Unit) in 1999, and the Nooksack River was listed as critical habitat for Chinook salmon shortly after (WSR, 2003). The Nooksack River is further listed for supporting Puget Sound distinct population segment steelhead, which are listed as threatened as of 2007. The bull trout is also listed as threatened and is present in three stocks in the Nooksack River.

Fish and Wildlife Migration Routes

Existing Conditions

The watershed of this area supports egg, larvae, juvenile, and adult life-stages of salmon and trout. For diadromous species like salmon and trout, deltas and estuaries are critical zones; therefore, these areas are key environments for migrating fish.

Great blue heron (*Ardea herodias*), likely reside and migrate in this area and are also abundant in the mud flats of the delta. Bald eagles (*Haliaeetus leucocephalus*) can also be spotted in the trees on the bluff and along the shore. Most of the Puget Sound is part of the western flyway for migratory waterfowl, which are abundant in the Bay, including many species ducks and geese. Gulls and other shorebirds are also very common in the area as well as songbirds, deer, and rabbit.

Proposed Project

The Smith Gardens Shoreline Stabilization Project and Smith Heritage Long Plat proposals would require the removal of at least 16,000 square feet of vegetation from the bluff below the gardens, some of which is inside the 200-foot shoreline district. The removal of plants and addition of non-permeable surfaces such as roads, houses, and driveways will lead to increased runoff into the bay. Increasing the amount of runoff decreases the amount of water available to native vegetation. Furthermore, human activities from the proposed development will likely increase the amount of pollution that will end up in the Bay via increased runoff. Removal of trees and shrubs, coupled with increased human activity, will therefore decrease habitat quality and availability, thereby decreasing biodiversity in the area.

Project Alternative

The project alternative of five long lots with houses set back from the bluff would also increase runoff in the area, but in lower amounts than the proposal due to less non-permeable surfaces and by leaving all of the current bluff vegetation intact. Planting native vegetation and removing invasive species on the lots would increase available habitat for other native species.

No Action

If no action were taken, all of the current vegetation and animal species would remain, and species would not have to be cleared or disturbed.

6.4 Greenhouse Gas Analysis

King County Department of Development and Environmental Services created a document that allows greenhouse gas (GHG) emissions to be estimated. Using the formulas embedded in the worksheet, GHG emissions for the project, project alternative, and no action are approximated in the graph below:

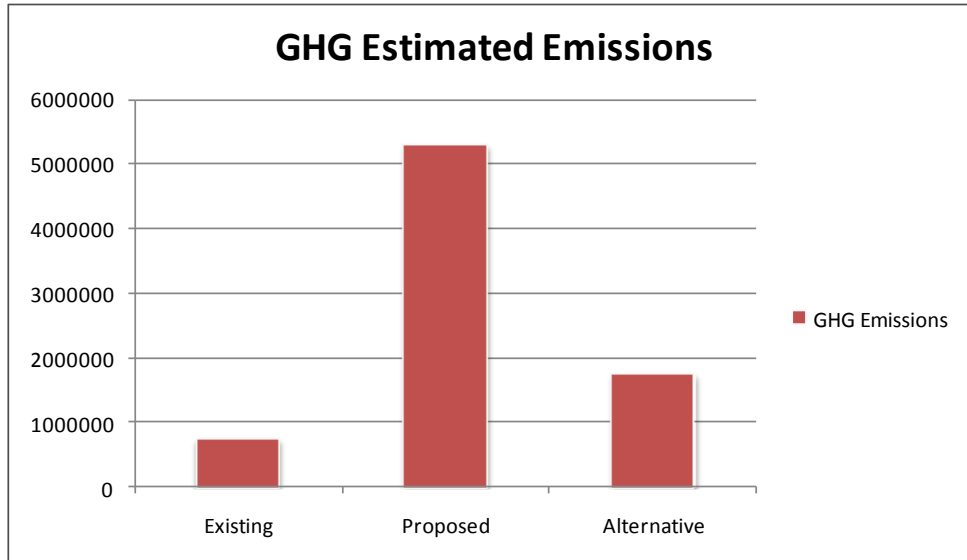


Figure 14- GHG Emissions
(See Appendix A for the spreadsheets)

In order to estimate GHG emissions, some assumptions had to be made. For instance, part of the emission calculation requires the amount of pavement for the project; this information was not readily available. However, the long plat map for the proposed project stated that 27 percent of the 9.47 acres to be subdivided would be covered, so it was estimated that that would be roughly equivalent to the pavement amount. It is likely the houses were partially double-counted, as the other input in the worksheet was number of houses, but this may be roughly balanced out by the fact that the road widening was not factored in (due to lack of data). For the project alternative, it was assumed that the pavement was one-third of the project proposal, since there will be five houses instead of 15. For no action, the emissions were estimated for the existing two residences (though it is not known when these units were built).

As the graph illustrates, the proposed project will release the most GHGs. The bulk of these emissions are the result of the 15 houses, from construction on through each unit's life. Because the project alternative has only five houses, its estimated GHG emissions are considerably less than the proposal; no action has the least because there are only two current residences. More on the specific sources of greenhouse gas emissions is discussed in "Land & Shoreline Use" and "Transportation."

7.0 ELEMENTS OF THE BUILT ENVIRONMENT

7.1 Land & Shoreline Use

Land and Shoreline

Existing Conditions

The applicant's property is currently zoned RR1: rural residential with one single-family home per acre. Nonetheless, commercial greenhouse operations exist on the site, with 82 percent of the site being covered with impermeable surfaces. Aside from the 14 greenhouses, there are also two residences, one abandoned residential unit, and several sheds. Within the long plat, roughly 75 percent of the land is currently in use for nursery operations; the remaining 25 percent is open space. Moreover, while the application is technically for 15.16 acres, only 9.47 acres are actually being used for residential units (the remaining 5.69 acres encompass critical areas and space for a community septic system).



Figure 15- Shoreline

Furthermore, the shoreline of the applicant's property is a Shoreline of Statewide Significance and Conservancy under Whatcom County's Shoreline Management Plan (SMP). The SMP's two main goals are no net loss of ecological functions and shoreline restoration over time, both of which are required to be achieved by local programs and projects. The SMP prohibits residential development that requires shoreline stabilization (WCC 23.100.110.B(1)) and subdivisions that require substantial shoreline vegetation removal or shoreline modification (WCC 23.100.110.C). However, single-family and duplex residential development is a permitted use within a conservancy area under the SMP, provided that it does not require shoreline stabilization or substantial shoreline vegetation removal.

The shoreline of the applicant's property is also designated as a Critical Fish and Wildlife Habitat Conservation Area. Critical area regulations under WCC 16.16 require permitted development to mitigate all adverse impacts to critical areas; development projects that cannot do so shall be denied (WCC 16.16.260). Development projects are allowed in Habitat Conservation Areas (HCAs) as long as they meet the "reasonable use and variance standards" in WCC 16.16.270. "Reasonable use" includes the following: no feasible alternative (which includes a reduction in size) that will provide reasonable economic use with less adverse impact, locating the project as far from the critical area and buffer as possible, avoiding adverse effects on threatened and endangered species, maintaining ground and surface water quality, and not harming the property, health, and safety of nearby people. Additionally, development projects must fulfill all other applicable standards; relevant to this project, clearing and grading within HCAs are permitted only in the dry season (typically May to October).

The bluff on the applicant's property has been determined to be an Active Landslide Hazard Area under WCC 16.16.300. Development projects within Active Landslide Hazard Areas, as with Habitat Conservation Areas, are allowed as long as they meet "reasonable use and variance standards" in WCC 16.16.270.



Figure 16- Bluff

Additionally, County regulations require subdividing land partially within a geologically hazardous area or its buffer to have "sufficient buildable area outside of the hazardous area with provision for drainage, erosion control and related features that will not adversely affect the hazard area or its buffer" (WCC 16.16.320). Storm water conveyance shall be aboveground and be designed and/or anchored in a manner that will allow it to continue to function should the slope fail.

There is a Critical Wetland Area located on the southeast corner of the applicant's property. Development projects within Critical Wetland Areas, as with Habitat Conservation Areas and Geologically Hazardous Areas, are allowed as long as they meet "reasonable use and variance standards" in WCC 16.16.270. The wetland on the property has been determined by the applicant to be a High Intensity Category III wetland with a low level of function for wildlife habitat, giving it a buffer of 80 feet.

Proposed Project

The proposed project is in compliance with zoning regulations. Even though the actual residential lots are between .37 and .56 acres, the fact remains that the long plat incorporates a 15.16-acre space, meaning that there is just over 1 acre for each residential unit. This designation can be made because the plat includes critical areas. Additionally, greenhouses do not count as units under Whatcom County Code.

With respect to the Critical Fish and Wildlife Habitat Conservation Area, Critical Wetland Area, and Active Landslide Hazard Area, the project could be found to meet those regulations depending on how "reasonable economic use" is defined. Residential development is allowed in critical areas as long as the development meets reasonable use and variance standards, one of which is reasonable economic use. If the County determines that the 15-lot subdivision is a reasonable economic use under current law with no viable alternative that would give comparable economic use, then the project would be in compliance with these critical areas regulations. Furthermore, given existing nursery uses immediately north of the proposed subdivision, it would seem that the project is located as far from the critical areas and their buffers as possible. However, it can be argued that there does exist a feasible alternative with less adverse impacts (see Project Alternative), which may suggest a conflict with these critical areas regulations.

Lots 7 through 11 and some drainage infrastructure are partially located within the seismic stability setback. As a result, these lots and the drainage structures will have to be constructed in accordance with WCC 16.16.320, meaning that there must be sufficient buildable area outside the hazard buffer and that the erosion control and drainage features must not adversely impact the buffer. Judging by the site plan, it would seem that the applicant is planning to have sufficient buildable space outside the buffer. The drainage system is largely comprised of two outfalls in the southern corners of the property, which suggests it does not adversely impact the seismic buffer.

The project is not, however, in compliance with the Shoreline Management Plan. While subdivision for single-family or duplex structures is permissible, the SMP expressly prohibits residential development that requires shoreline stabilization or significant removal of vegetation. Both are present in the project. The long plat of 15 residential units requires the bluff to be stabilized in order to provide adequate safety for the homes, and the bluff stabilization work will strip the present vegetation from the bluff. Under existing regulations, it would appear that the bluff stabilization does fall under “shoreline stabilization” expressed by the SMP, and that the bluff stabilization work falls under the jurisdiction of the SMP as it is within the 200-foot shoreland area (WCC 23.110.190). For the project to proceed, the applicant will need some kind of permit (or the SMP would have to be ignored).

The main impact of the proposed project is that it creates shoreline uses that are inconsistent with existing code regulations. The project calls for an extensive bluff stabilization, which would require the removal of native vegetation. This is inconsistent with the Shoreline Management Plan. Proceeding with the proposed stabilization of the bluff would decrease, perhaps critically, the ecological functions of the bluff and its shoreline. The bluff, being a part of a river delta, has fluctuated with time, playing a significant role as a feeder bluff. Stabilizing the bluff to support 15 residences would negate this ecological function.

Moreover, proceeding with the bluff stabilization would remove much of the native habitat present. The Shoreline Management Plan would have shoreline uses preserve ecological functions and restore the shoreline over time. Removing native vegetation from an unstable bluff achieves the exact opposite, and is why such actions are prohibited under the SMP.

Removing vegetation would also release greenhouse gases. Vegetation sequesters carbon dioxide; its removal would serve to eliminate that carbon sink, in addition to releasing the carbon stored in the soil (as the soil is disturbed, the carbon dioxide trapped therein is released). While the applicant proposed in the environmental checklists to retain native vegetation on the lower half of the bluff, the upper half of the bluff would have a clover-grass mix. While this is not known for sure, it is logically assumed that native shrubs and trees are able to store more carbon than grasses. The result, therefore, is a net release of greenhouse gases.

There are no immediate mitigation measures to alleviate the impacts of the proposed shoreline use, as the use is inconsistent with existing regulations. The Shoreline Management Plan expressly prohibits residential subdivision and development that requires shoreline stabilization and removal of shoreline vegetation. It could be possible to stabilize the bluff solely through native vegetation restoration, but this approach may take years for the bluff to reach the level of

safety required for residential units. Otherwise, the project cannot be allowed to proceed under existing law.

Recently, the applicant submitted a proposal to move the private access road a bit north. This would allow lots 7 through 15 to move north also, likely removing them from the seismic stability setback and potentially eliminating the need for bluff stabilization work. If this alteration to the project is accepted and the bluff stabilization is abandoned, then the project would be in compliance with the SMP and any significant adverse land and shoreline use impacts would be mitigated.

Project Alternative

The project alternative would eliminate any discrepancies between the proposed project and the Shoreline Management Plan (as well as the critical areas regulations), meaning it has no significant adverse land and shoreline use impacts. Having only five long lots with the houses placed in the back and avoiding the bluff stabilization allows residential development within the shoreline area to be lawful under the SMP. The bluff would maintain and perhaps even enhance its native vegetation, which would achieve the SMP's main goals of preserving ecological functions and potentially restoring the shoreline over time as well as provide stability for the bluff with respect to erosion and landslides (which would be preferred under the Geologically Hazardous Area regulations). Furthermore, reducing the number of houses and abandoning the bluff stabilization would alleviate the pressure that would have been placed on the Critical Fish and Wildlife Habitat Conservation Area and the Critical Wetland Area by the proposed project in addition to retaining most of the greenhouse gases that would have otherwise been released.

No Action

Land and shoreline use would remain the same. The absence of the bluff stabilization would have similar results as under the Project Alternative, namely that of avoiding undue pressure placed on and maintaining the Habitat Conservation Area and the Critical Wetland Area. The existing greenhouse sitting on top of the bluff may have to be removed in the near future under this alternative.

Potential Future Use

The County Council has recently proposed designating the Fort Bellingham and Marietta neighborhoods as "limited areas of more intense rural development" (LAMIRDs). This would allow development as intense as that proposed (15 houses on 9.47 acres) within the present Rural Residential-1 zone.

The County presently prohibits LAMIRDs within one mile of an Urban Growth Area; the rationale, presumably, is that having more intense development beyond the UGA results in a de facto expansion of the UGA. A related concern with LAMIRDs, especially close to UGAs, is sprawl. Having more intense development spread out over a larger area causes the adverse impacts to spread with it. The proposed LAMIRD that incorporates Smith Gardens abuts one of Bellingham's UGAs and would therefore not presently be permissible; however, the County plans to abolish the one-mile rule if it goes ahead with these designations.

Housing

Existing Conditions

Presently, there are only three residential units on the property, one of which is abandoned. Two of those houses are within the long plat and are slated to remain, and presumably will serve as the houses for lots 2 and 5.

Proposed Project

The applicant is seeking to build an additional 13 houses within the long plat. The average lot size will be 27,485 square feet (.63 acres), with the overall building coverage for the parcel being 27 percent. These homes are planned to be for high- to middle-income residents.

The Long Plat Environmental Checklist done by the applicant suggests that the houses will be built in accordance with the International Building Code as a way to ensure energy efficiency. However, in no documentation witnessed thus far has this been made a requirement, meaning energy-efficient homes may not actually be the reality.

Furthermore, the construction of the residential units will release greenhouse gases. The existing nursery buildings will have to be taken down and the land reconfigured to residential needs. This disturbance of the land will likely release greenhouse gases that may be stored therein. However, it is likely that converting the plat from largely greenhouse operations to residential lots will increase the amount of open space on the parcel and thereby increase the area's carbon sink capacity. The problem is that in order for this to occur, the bluff has to undergo major stabilization and Fort Bellingham Road must be widened, both of which will likely release sizeable amounts of carbon dioxide; it is difficult to know, therefore, if the increase in open space in the long plat would offset the overall amount of greenhouse gases released by the project.

Another concern with having 15 houses on almost 9.5 acres is sprawl. Having residential units on .37- to .99-acre lots is denser than the zoning for the area would suggest. As mentioned earlier, sprawl adversely impacts the environment, typically by destroying or polluting it. Particularly since the houses would be built nearby a bluff and critical areas therein, encouraging sprawl here would be counterintuitive and may endanger the welfare of the potential occupying families. While the 15 houses proposed by the project may not in and of themselves significantly contribute to sprawl, the concern is likely rooted in the fear that allowing this project would serve as a stepping stone for future projects of a similar nature to go forward, essentially creating sprawl by slippery slope.

Project Alternative

The project alternative would only see three additional houses built (in addition to the two that are remaining). Because this alternative calls for five long lots instead of 15 lots, the average lot size would likely be more than double the average lot size under the proposed project. These three houses, under this alternative, would be built in accordance with the International Building Code to ensure energy efficiency.

The construction involved in building the three additional houses would still release greenhouse gases, but much less than what would be witnessed under the proposed project. The greenhouse

gases released by removing the existing nursery buildings and converting the land to residential use will also be present in this alternative, but, as the bluff will not undergo the stabilization project, Fort Bellingham Road will not be widened, and more space will be open with native vegetation, it is possible that in the longer run this alternative may have a net sequestration of carbon dioxide.

Building only three new homes (and having a total of five houses) would remove the threat of sprawl and the associated impacts and concerns, since each lot would be greater than the one-acre minimum lot size.

No Action

The existing conditions would be maintained; no new houses would be built. As a result, the existing buildings would not have to be taken down (aside, perhaps, from the one greenhouse on the bluff) and the land would not be converted to residential use. This would mean no release of greenhouse gases, nor any issues with sprawl.

Potential Future Action

According to a comment letter filed by Eglick Kiker Whited PLLC on behalf of Laura Chandler, the applicant is planning on developing 24 more residential lots on the northern portion of the property sometime in the future. The impacts of this would mirror those discussed in the proposed project above, but on a greater magnitude. It is questionable whether or not 24 residential units in the northern portion of the property would be allowed under existing law, but, should the County's proposed "limited area of more intense rural development" pass, the 24 residential lots would most likely be a use by right.

Moreover, the applicant recently submitted an update to the long plat with respect to lot size and housing placement. The applicant proposed to move the private access road north, reducing the size of lots 1 through 6 and pushing back lots 7 through 15 so that they are not right on the bluff. While this would potentially mean the bluff stabilization could be avoided, shrinking lots 1 through 6 could create greater sprawl concerns. Lots 1 through 5 already are already around or under .5 acres; shrinking them further would potentially allow future projects to have the same high-density lots and aggravate the concerns about future sprawl and its effects.

7.2 Transportation

Existing Conditions

The Smith property, including the portion now proposed for residential development, is currently served by an unimproved road down the center of the property, accessed from Old Marine Drive to the north. Old Marine Drive intersects with Marine Drive a few hundred feet to the west of the site. Fort Bellingham Road is adjacent to the Smith property and is the access road for several surrounding neighbors. Fort Bellingham Road is constructed



Figure 17- Fort Bellingham Road

of chip-seal pavement, ranges from 16 to 22 feet in width, and is approximately 1,700 feet in length. The road surface is in generally good condition with a few isolated areas of visible cracks.

There are no frequent stops on Marine Drive nor is there a bus stop in close vicinity to the site. The nearest bus stop is roughly 1 mile away on Marine Drive, where WTA bus number 50 runs every couple hours.

Proposed Project

A new private road would be constructed within the plat, and, along with Fort Bellingham Road, would provide access to the project. Fort Bellingham Road cannot hold significant numbers of vehicles. A condition of the plat approval as identified by in the Traffic Impact Analysis will be to improve the existing Fort Bellingham Roadway to meet minimum Whatcom County standards. Improvements would include widening the road and improving the road's system of drainage ditches. The road would be widened to a minimum width of 20 feet with 3-foot shoulders on both sides.

The proposed project would cause a reduction in air quality via increased transportation. Although transportation is a vital part of the economy and is essential for everyday activities, it is also a significant source of greenhouse gas emissions. Looking forward, transportation GHGs are forecasted to continue increasing rapidly, reflecting the anticipated impact of factors such as economic growth, increased movement of freight and trucks, and continued growth in personal travel. With the construction of 15 new single-family homes, the number of cars traveling within the area would increase, creating an increase in the GHG emissions, exhaust, particulate matter, and so forth.

Project Alternative

With only five lots being developed instead of 15, vehicular traffic will not increase at a significant level and the roads would not need to be severely improved to accommodate the increased traffic. If only five houses were built, Fort Bellingham Road would not need to be widened. Anything more than five lots would create a need for an improved road, which would cut into people's land and cause loud construction noise for the neighbors near the Smith property.

No Action

If no action were pursued, transportation would not change. The daily trips would remain relatively the same and the roads would not need to be improved or altered. A new road within the Smith property would also not be built.

7.3 Public Services & Utilities

Emergency Services

Existing Conditions

Fort Bellingham neighborhood, including Smith Gardens, belongs to Whatcom Fire District #8. This district is outside the Urban Growth Area in a designated rural residential area. For fire

protection, emergency response, and basic life support services, Whatcom Fire District #8 uses both volunteers and paid staff. Residents here receive these services.

Proposed Project

The addition of fifteen three-bedroom homes in dense (<1 acre) cluster housing outside the Urban Growth Area will not supply the many new residents with proper fire protection response. Whatcom Fire District # 8 responded to the long plat division by stating: “The district will respond as best it can in light of the dependency upon volunteers and considering the limited resources of the district, as well as the limited expectation of service that accompanies land within a rural area. The subject property will not receive urban levels of service.” This dense development is not guaranteed prompt safety services. One potential way to mitigate this issue would be to change the designation from residential rural area to a “limited areas of more intense rural development,” provided the amount of resources available to Whatcom Fire District #8 grew with such a designation. The amount of resources that the Whatcom Fire District #8 receives could also be expanded to have a full time paid staff, which could increase the availability of a response to emergencies.

Project Alternative

While the addition of only five houses does not change the rural residential designation or the response that the Whatcom Fire District #8 will have to an emergency, there will be a third of the people living in the area needing those services. If there are one third the people, then the area would not require urban level of emergency response services. With an increase of houses and people in the vicinity, the likelihood of an emergency will increase; to mitigate this likelihood, more funding could be given to Whatcom Fire District #8, increasing availability of emergency services.

No Action

No action will not alter the conditions or need for emergency services.

Utilities: Septic System

(See Groundwater Runoff: Septic)

7.4 Environmental Health

Noise

Existing Conditions

The largest present source of noise in the area comes from tractors and equipment of greenhouse operations. The noise level from these operations is moderate and only during working hours. Any other noise comes in small amounts from residents in the area, driving vehicles, or running personal machines and equipment.

Proposed Project

Daytime construction from bluff renovation and lot development would increase the noise level while construction lasts. This may include, but is not limited to, dump trucks, excavators, backhoes, and one-ton trucks. Increased human activity from 15 new houses would also lead to

an overall increase of noise in the area from vehicles, people, and pets. Other environmental health hazards that could occur as a result of the proposal are fuel or chemical spills during construction. Any accidents in this area would potentially lead to toxins entering the bay via runoff.

Project Alternative

The project alternative would also require construction traffic, though producing less noise for less time than the proposal. Impacts would be less due to fewer vehicles, less input of material, and fewer people in the area than the proposal. If runoff and sewage treatments work as planned after construction, there would likely be no negative effects on environmental health. In fact, if mitigation measures were made to continue facilitation of native species and removal of non-native species, the environment of the area may benefit.

No Action

No action on this site would result in no increase of noise or construction traffic in the area. The area would remain the same, maintaining its current level of environmental health.

8.0 DECISION MATRIX

Environmental Element	Proposed Project	Project Alternative	No Action
Earth			
Geology	-	0	0
Soil and Erosion	-	0/+	0/-
Water			
Surface Water	-	-	-
Runoff	-	-	-
Ground Water	-	-	0
Plants and Animals			
Fish and Birds	-	0/+	0
Plants	-	+	0
Land and Shoreline Use			
Relationship to Existing Plans	-	0	0
Open Space	+	+	0
Public Services and Utilities			
Fire and Police	-	0	0
Storm Water and Sewer	-	-	-
Transportation			
Traffic and Traffic Hazards	-	-	0
Transportation Systems	-	-	0
Environmental Health			
Noise	~	~	0

Figure 18- Decision Matrix

+ = Improved - = Degraded 0 = Maintained/No Impact
 ~ = Temporarily degraded

9.0 GLOSSARY

9.1 Acronyms

ADT – Average Daily Trips

BMP – Best Management Practices

DOE – Department of Ecology

DNS – Determination of Non-Significance

DS – Determination of Significance

EIA – Environmental Impact Assessment

EIS – Environmental Impact Statement

SMP – Shoreline Management Plan

UGA – Urban Growth Area

USDA – U.S. Department of Agriculture

WAC – Washington Administrative Code

WTA – Whatcom Transit Authority

9.2 Technical Terms

Anadromous:	Fish that migrate from salt water to fresh water to spawn.
Best Management Practices:	Site design strategies, techniques and technologies that enable you to develop a site with minimal adverse effects on the environment.
Biodiversity:	Diversity among and within plant and animal species in an environment.
Bioswale:	Landscape elements designed to remove silt and pollution from surface runoff water.
Bluff:	A high, steep bank, by a river or sea, or beside a ravine or plain; a cliff with a broad face.
Diadromous:	Fish that travel between salt water and fresh water.
Embayment:	An indentation of a shoreline.
Endangered Species:	Species present in such small numbers that it is at risk of extinction.
Erosion:	The group of natural processes, including weathering, dissolution, abrasion, corrosion, and transportation, by which material is worn away from the earth's surface.
Geological Hazard:	A natural geologic event that can endanger human lives and threaten human property. Such events include landslides, earthquakes, geomagnetic storms, tsunamis, sinkholes, and volcanoes.
Glaciofluvial Deposits:	Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice.
Glaciomarine:	Describing an environment containing both glacial ice and marine water.
Impervious Surface:	A surface that does not permit the absorption of fluids.
Invasive Species:	A species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic environmental harm or harm to human health.
Landslide:	The downward sliding of a relatively dry mass of earth and rock.
Loess:	A loosely compacted yellowish-gray deposit of windblown sediment of which extensive deposits occur.

Long Plat:	A platting procedure used when a division of land is proposed in which property, such as roads or easements, are proposed for dedication.
Mitigation:	The action of reducing the severity or seriousness of something.
Native Species:	A species that occurs naturally with respect to a particular ecosystem, rather than as a result of an accidental or deliberate introduction into that ecosystem by humans.
Runoff:	The water from rain, snowmelt, or irrigation that flows over the land surface and is not absorbed into the ground, but instead flowing into streams or other surface waters or land depressions.
Rain Garden:	Planted depression that allows rainwater runoff from impervious urban areas like roofs, driveways, walkways, and compacted lawn areas the opportunity to be absorbed.
Sediment:	Solid fragments of inorganic or organic material that come from the weathering of rock and are carried and deposited by wind, water, or ice.
Shorelands or measured shore-land areas:	Those lands extending landward for 200 feet in all directions as on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river deltas associated with the streams, lakes and tidal waters which are subject to the provisions of Chapter 90.58 RCW.
Shorelines:	All of the water areas of the state as defined in RCW 90.58.030, including reservoirs and their associated shorelands, together with the lands underlying them except: <ul style="list-style-type: none"> a. Shorelines of statewide significance; b. Shorelines on segments of streams upstream of a point where the mean annual flow is 20 cubic feet per second or less and the wetlands associated with such upstream segments; and c. Shorelines on lakes less than 20 acres in size and wetlands associated with such small lakes.
Shoreline Management Act:	Passed by the State Legislature in 1971 and adopted by voters in 1972. The Act's goal is to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines.
Shoreline stabilization:	Structural or nonstructural modifications to the existing shoreline intended to reduce or prevent erosion of uplands or beaches. They are generally located parallel to the shoreline at or near the OHWM. Other construction classified as shore defense works include groins, jetties and breakwaters,

which are intended to influence wave action, currents and/or the natural transport of sediments along the shoreline.

Shorelines of statewide significance:

a. Those areas of Puget Sound and adjacent saltwaters between the ordinary high water mark and the line of extreme low tide as follows:

Birch Bay from Point Whitehorn to Birch Point; and

b. Those areas of Puget Sound and adjacent saltwaters north to the Canadian line and lying waterward from the line of extreme low tide; and

c. Those lakes, whether natural, artificial, or a combination thereof, with a surface acreage of 1,000 acres or more measured at the ordinary high water mark including Lakes Whatcom, Baker and Ross; and

d. Those natural rivers or segments thereof as follows: any west of the crest of the Cascade range downstream of a point where the mean annual flow is measured at 1,000 cubic feet per second or more; including the Nooksack River's mainstream, the North Fork upstream to its confluence with Glacier Creek in Section 6, Township 39 North, Range 7 East, W.M.; and the South Fork upstream to its confluence with Hutchinson Creek in Section 9, Township 37 North, Range 5 East, W.M.

e. Shoreline jurisdiction associated with subsections (15)(a), (c), and (d) of this section.

Threatened Species: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Urban Growth Area: A regional boundary set in an attempt to control urban sprawl by mitigating that the area inside the boundary be used for higher density urban development and the area outside be used for lower density development.

Wetland: A lowland area, such as a marsh or swamp that is saturated with moisture, especially when regarded as the natural habitat of wildlife.

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11.0 APPENDIX

Appendix A

This spreadsheet illustrates the total greenhouse gas emissions for the project proposal.

Section I: Buildings						
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO ₂ e)			Lifespan Emissions (MTCO ₂ e)
			Embodied	Energy	Transportation	
Single-Family Home.....	15		98	672	792	23428
Multi-Family Unit in Large Building ...	0		33	357	766	0
Multi-Family Unit in Small Building ...	0		54	681	766	0
Mobile Home.....	0		41	475	709	0
Education		0.0	39	646	361	0
Food Sales		0.0	39	1,541	282	0
Food Service		0.0	39	1,994	561	0
Health Care Inpatient		0.0	39	1,938	582	0
Health Care Outpatient		0.0	39	737	571	0
Lodging		0.0	39	777	117	0
Retail (Other Than Mall).....		0.0	39	577	247	0
Office		0.0	39	723	588	0
Public Assembly		0.0	39	733	150	0
Public Order and Safety		0.0	39	899	374	0
Religious Worship		0.0	39	339	129	0
Service		0.0	39	599	266	0
Warehouse and Storage		0.0	39	352	181	0
Other		0.0	39	1,278	257	0
Vacant		0.0	39	162	47	0
Section II: Pavement.....						
Pavement.....		105,850.00				5292500
Total Project Emissions:						5315928

This spreadsheet illustrates the total greenhouse gas emissions for the project alternative.

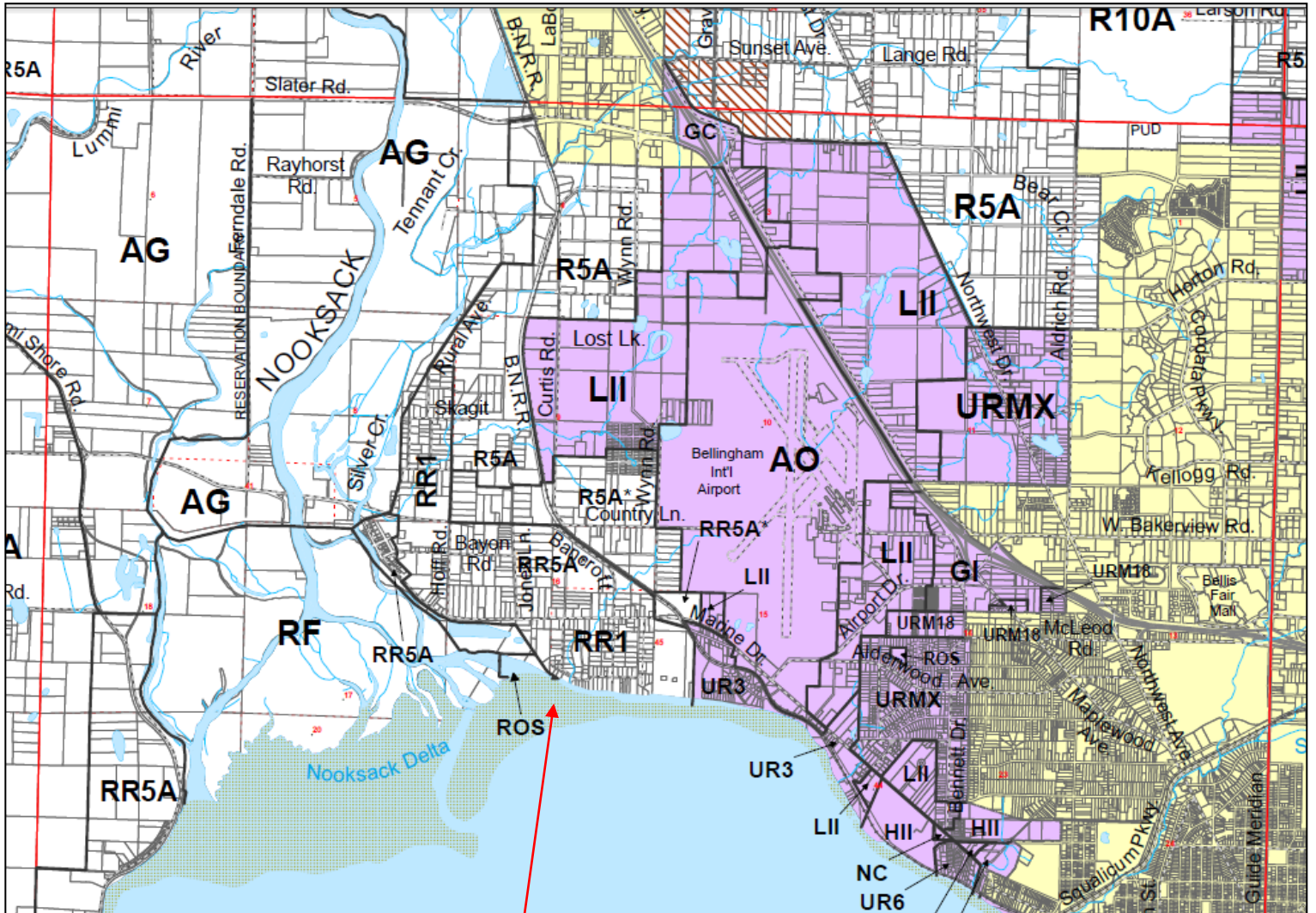
Section I: Buildings						
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			Lifespan Emissions (MTCO2e)
			Embodied	Energy	Transportation	
Single-Family Home.....	5		98	672	792	7809
Multi-Family Unit in Large Building ...	0		33	357	766	0
Multi-Family Unit in Small Building ...	0		54	681	766	0
Mobile Home.....	0		41	475	709	0
Education		0.0	39	646	361	0
Food Sales		0.0	39	1,541	282	0
Food Service		0.0	39	1,994	561	0
Health Care Inpatient		0.0	39	1,938	582	0
Health Care Outpatient		0.0	39	737	571	0
Lodging		0.0	39	777	117	0
Retail (Other Than Mall).....		0.0	39	577	247	0
Office		0.0	39	723	588	0
Public Assembly		0.0	39	733	150	0
Public Order and Safety		0.0	39	899	374	0
Religious Worship		0.0	39	339	129	0
Service		0.0	39	599	266	0
Warehouse and Storage		0.0	39	352	181	0
Other		0.0	39	1,278	257	0
Vacant		0.0	39	162	47	0
Section II: Pavement.....						
Pavement.....		34,930.00				1746500
Total Project Emissions:						1754309

This spreadsheet illustrates the total greenhouse gas emissions for the no-action alternative.

Section I: Buildings			Emissions Per Unit or Per Thousand Square Feet (MTCO ₂ e)			
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Embodied	Energy	Transportation	Lifespan Emissions (MTCO ₂ e)
Single-Family Home.....	0		98	672	792	0
Multi-Family Unit in Large Building ..	0		33	357	766	0
Multi-Family Unit in Small Building ..	0		54	681	766	0
Mobile Home.....	0		41	475	709	0
Education		0.0	39	646	361	0
Food Sales		0.0	39	1,541	282	0
Food Service		0.0	39	1,994	561	0
Health Care Inpatient		0.0	39	1,938	582	0
Health Care Outpatient		0.0	39	737	571	0
Lodging		0.0	39	777	117	0
Retail (Other Than Mall).....		0.0	39	577	247	0
Office		0.0	39	723	588	0
Public Assembly		0.0	39	733	150	0
Public Order and Safety		0.0	39	899	374	0
Religious Worship		0.0	39	339	129	0
Service		0.0	39	599	266	0
Warehouse and Storage		0.0	39	352	181	0
Other		0.0	39	1,278	257	0
Vacant		0.0	39	162	47	0
Section II: Pavement.....						
Pavement.....		15,000.00				75000
Total Project Emissions:						75000

Appendix B

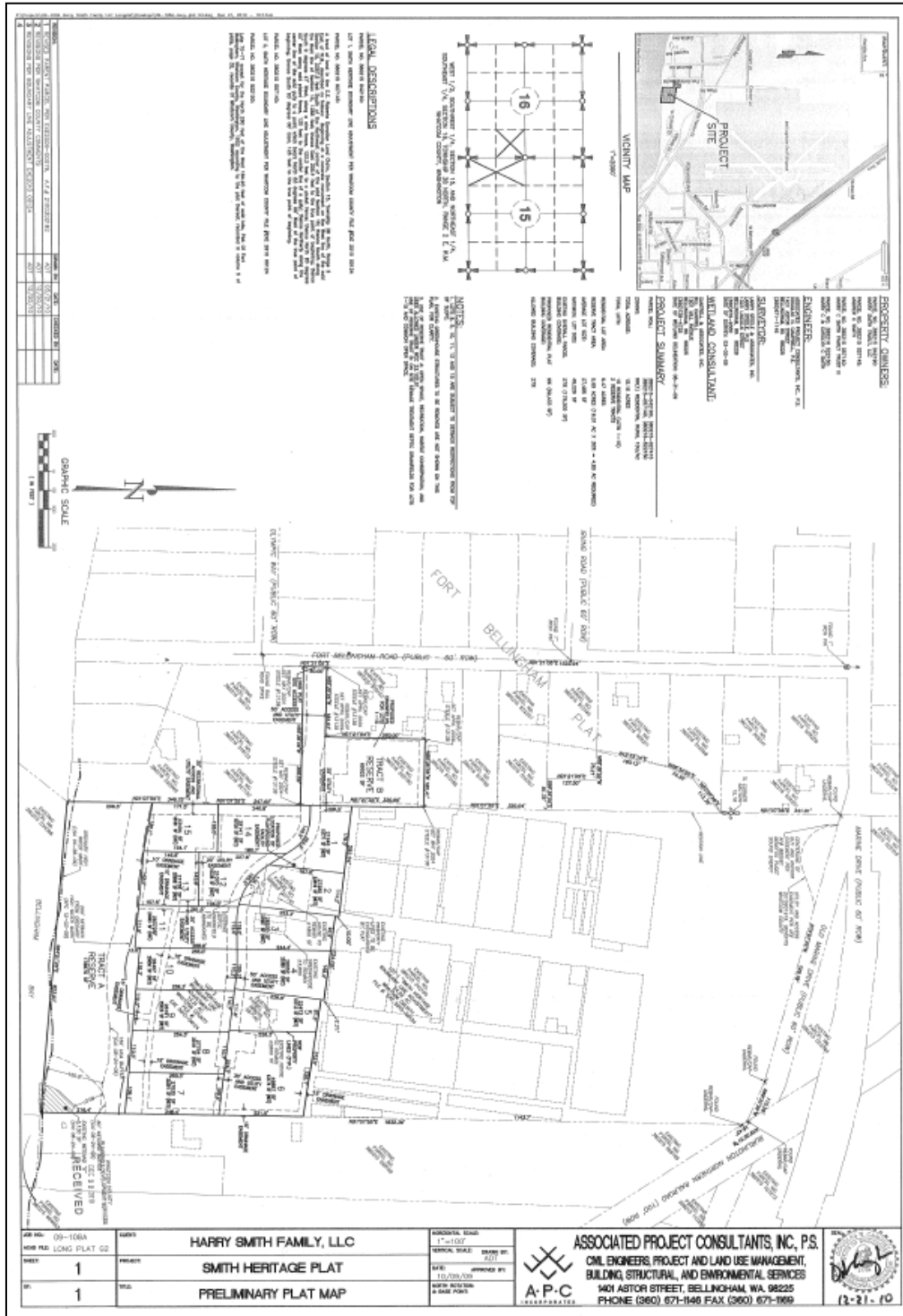
Map of Bellingham and Whatcom County Zoning. The arrow represents the location of Smith Gardens in the RR1 Zoning and shows its surrounding zoning areas.

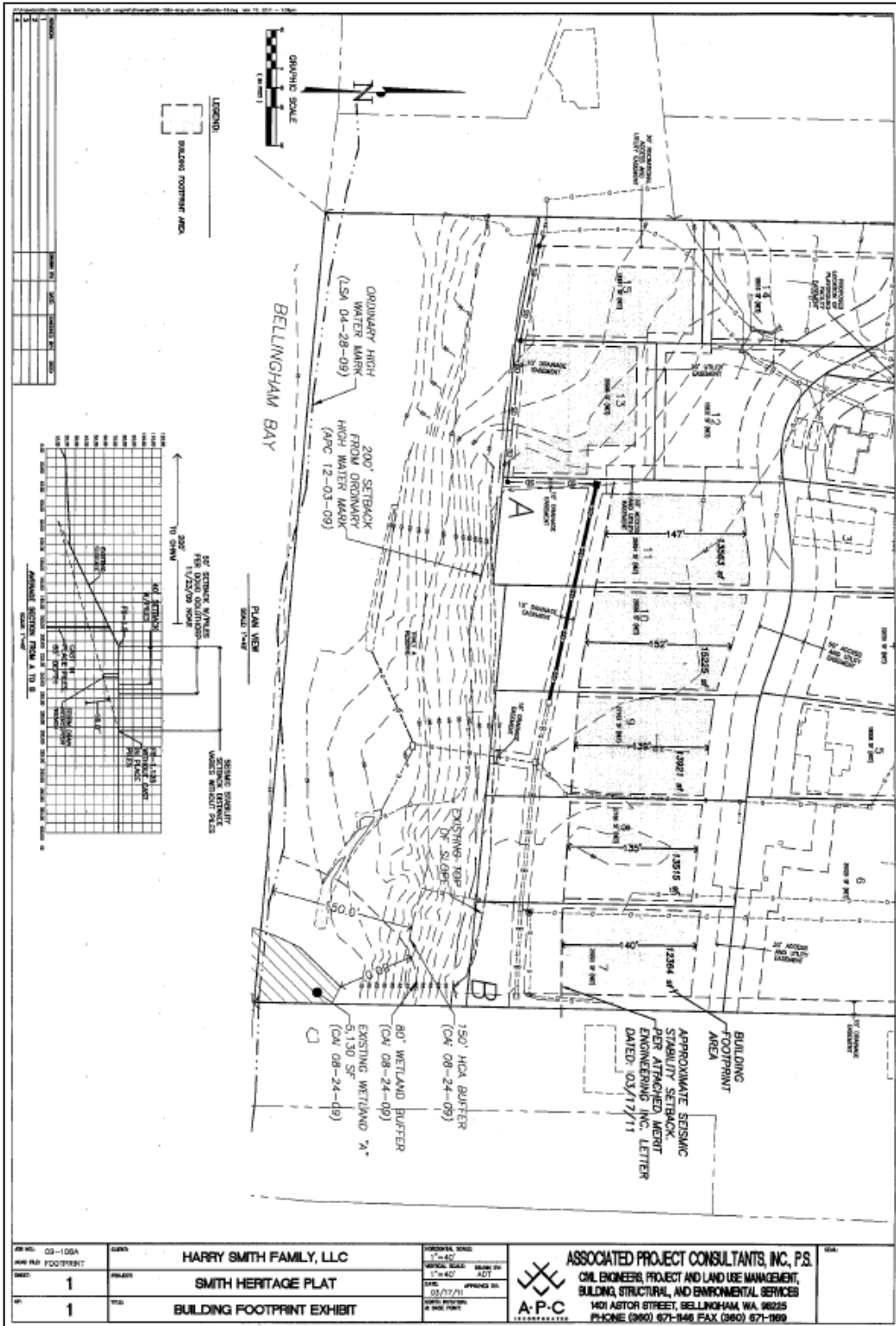


Smith Gardens

Appendix C

These maps of the Proposed Project contain 15 new lots for single-family homes as part of the long plat application.





PROJECT NO.	03-100A
DATE	05/17/11
NO.	1

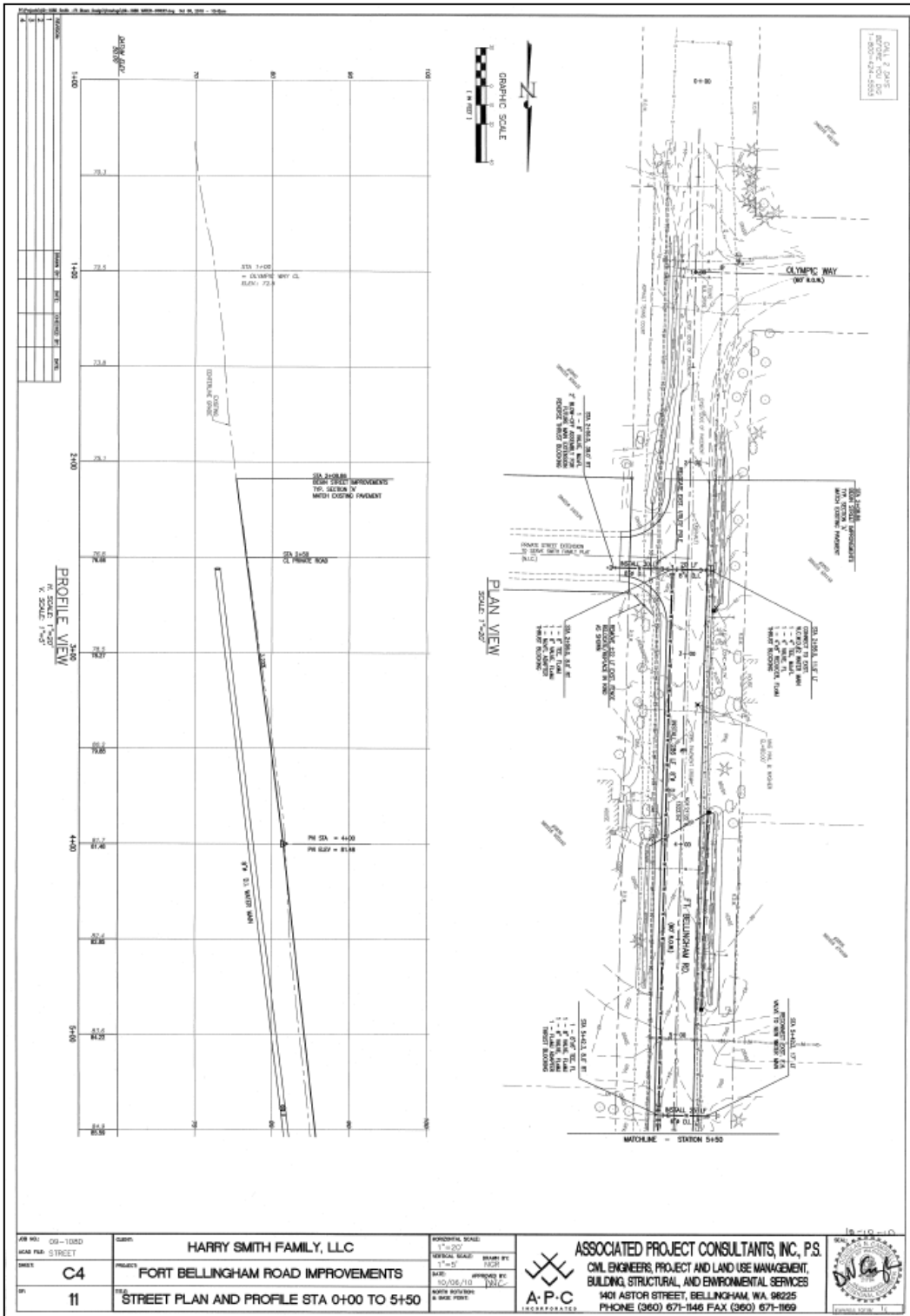
CLIENT	HARRY SMITH FAMILY, LLC
PROJECT	SMITH HERITAGE PLAT
TITLE	BUILDING FOOTPRINT EXHIBIT

DESIGNED BY	ADT
DATE	05/17/11
PROJECT NO.	03-100A
SCALE	1" = 40'

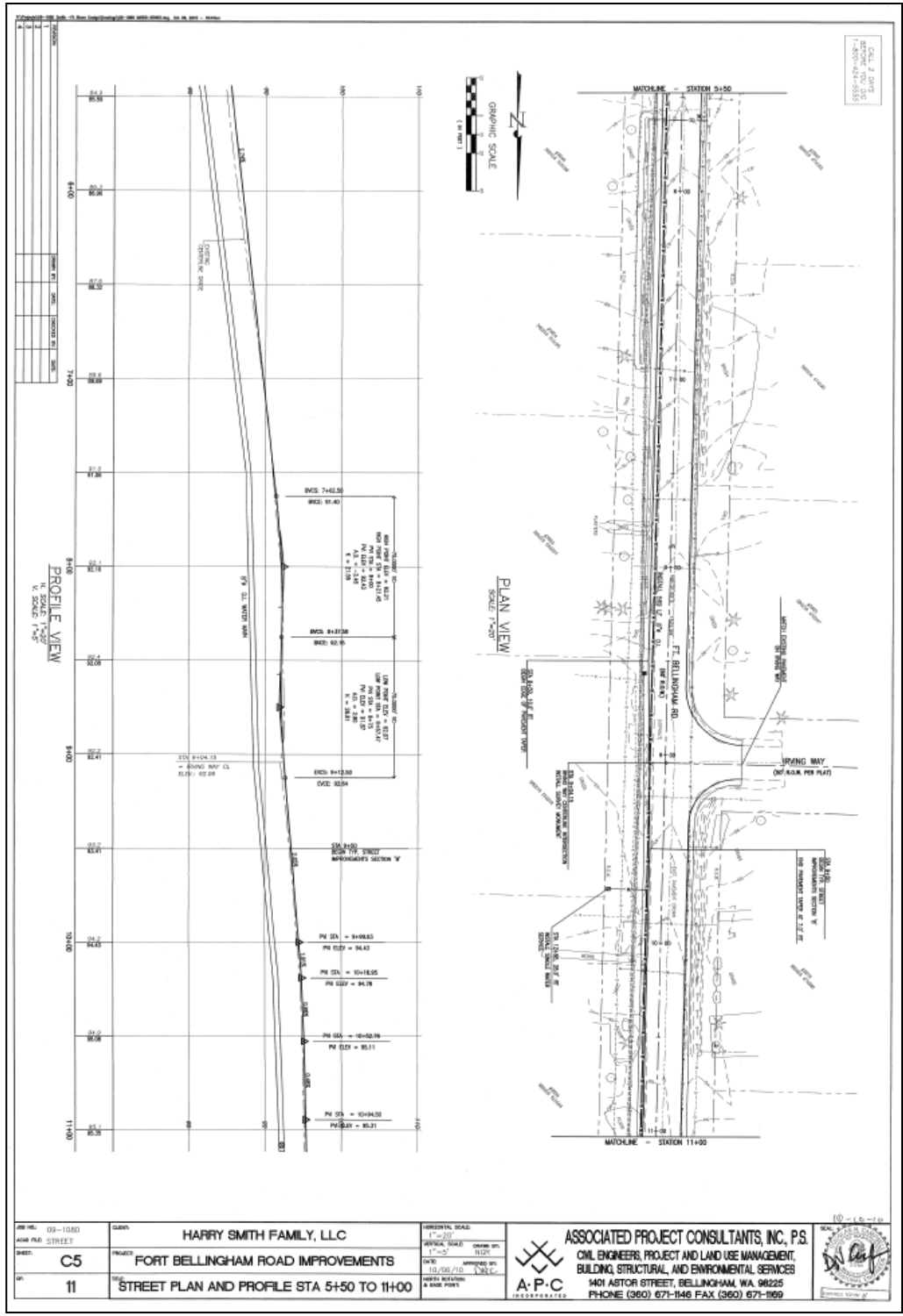
ASSOCIATED PROJECT CONSULTANTS, INC. P.S.
 CIVIL ENGINEERS, PROJECT AND LAND USE MANAGEMENT,
 BUILDING, STRUCTURAL, AND ENVIRONMENTAL SERVICES
 1401 ASTOR STREET, BELLINGHAM, WA 98225
 PHONE (360) 671-8466 FAX (360) 671-8669

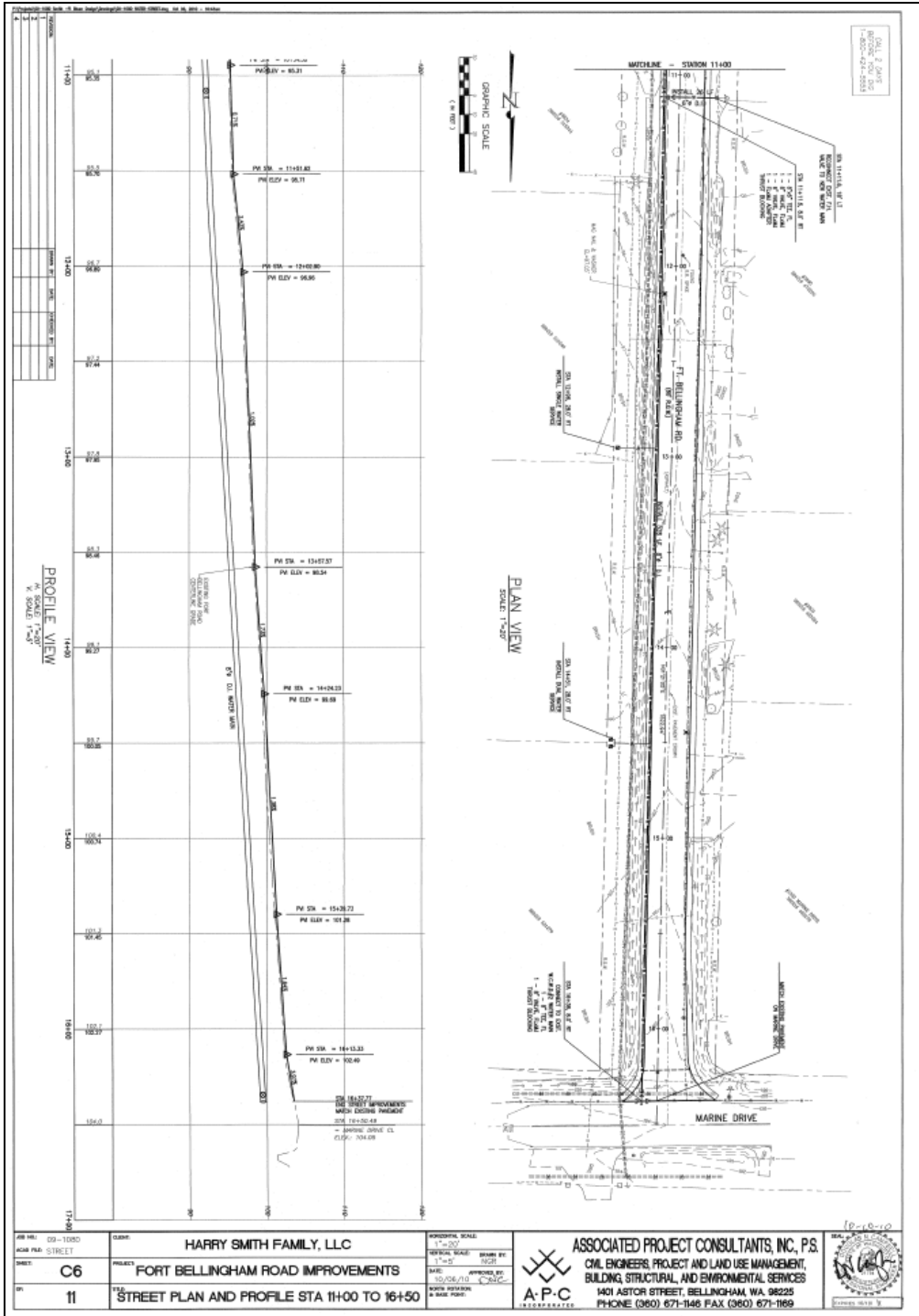
Appendix D

These maps represent Fort Bellingham Road and its improvements by widening the road.



AR NO: 09-1035D DATE: FEB. 2008 SHEET: C4 OF: 11	CLIENT: HARRY SMITH FAMILY, LLC PROJECT: FORT BELLINGHAM ROAD IMPROVEMENTS TITLE: STREET PLAN AND PROFILE STA 0+00 TO 5+50	HORIZONTAL SCALE: 1"=50' VERTICAL SCALE: 1"=5' DATE: 05/06/10 DRAWN BY: [Signature] CHECKED BY: [Signature]	ASSOCIATED PROJECT CONSULTANTS, INC., P.S. CIVIL ENGINEERS, PROJECT AND LAND USE MANAGEMENT, BUILDING, STRUCTURAL, AND ENVIRONMENTAL SERVICES 1401 ASTOR STREET, BELLINGHAM, WA. 98225 PHONE (360) 671-1146 FAX (360) 671-1169	
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Appendix E

These pictures show how the shoreline has changed over the years.



1998



2005



2009