

Memo

To: Frank James and David Bricklin

Date: October 17, 2009

From: Llyn Doremus

Subject: Fairhaven Highlands DEIS - October 20 Public Hearing Comments - Hydrology and Earth Elements

Introduction

The Fairhaven Highlands DEIS broadly describes the affected environment for the proposed development, the general impacts of developing it under the six alternatives proposed, and very brief descriptions of the specific environmental effects of the six alternatives to the earth and water on the site. These comments address the general impacts of development of Fairhaven Highlands, because very little information is included in the DEIS regarding the specific differences of the environmental impacts of each of the alternatives.

In most cases the DEIS mentions that environmental impacts can be expected from the various project components commented on in this memo. However, instead of describing and assessing those impacts, the document goes on to describe potential mitigation measures to address the impacts. The DEIS is supposed to identify and delineate those impacts so that there is sufficient basis to determine whether the project should be approved and, if so, what mitigation measures are necessary to ensure that those impacts are reduced or removed. The key piece of information that the DEIS is supposed to provide, the identification, description and quantification of the environmental impacts from the project construction is missing for most aspects of the project from the document.

Earth

Background:

The geology of the site is an important factor in how water is stored, distributed, transported through and discharged from the site. The entire site is underlain by rocks that water seeps through very slowly. So water tends to accumulate near the surface and migrate sideways. This has apparently caused the formation of numerous wetlands

on the site. The soil layers formed on these rocks has a higher capacity for water infiltration than the rocks below them. Soils transmit water laterally at shallow depths to the onsite wetlands, and off site to Chuckanut Creek and Padden Creek.

Impacts

Blasting

All six alternatives identify removal of rock and sediments above the elevation of 228 to 240 feet (depending on the alternative) removing about 25 vertical feet of material. Explosions affect the surrounding rock that remains after the blast, in addition to the blasted rock that is removed, decreasing the competence and destabilizing the steep slopes. Blasting will also open up new cracks in existing rock, changing the pathways for water migration – also affecting the competence of the existing rock and the water supplied to wetlands on the site. The instability generated will increase the risk of landsliding and slope failures on site, and on the steep slopes to the north of the site. Mass wasting will damage the existing built environment surrounding the site, the structures and infrastructure on the site, release sediments for transport to and accumulation in wetlands on the site, and contribute sediment loading to downstream surface water bodies (Chuckanut Creek, Padden Creek and Bellingham Bay) and their associated wetlands. These impacts were not identified or assessed in the DEIS, and need further study.

Landslides along Chuckanut Drive are known as a recurring, long standing problem. Landslides originate in the Chuckanut formation (geologic unit), adjacent to the road, and result in the movement of such large volumes of soil and sediment, that Chuckanut Drive is regularly closed for extended periods while the road is cleared. The known instability of the Chuckanut formation, which underlies all of the Fairhaven Highlands site is not considered in assessing the risk of landsliding and impacts associated with landslides on the surrounding environment in the DEIS. (This directly contradicts the assertion on page 3-12 that states “no evidence of historical instability or rock sliding is present”).

Clearing and Grading

In clearing and grading the site, all six alternatives will entail removal of large quantities of soil and rock. Between 200,000 and 230,000 cubic yards will be excavated; and of that quantity (depending on the alternative) between 120,000 and 140,000 cubic yards will be removed from the site. The movement of such large portions of the ground surface will completely disrupt the natural patterns of water movement at the ground surface (wetlands and streams), and in the subsurface (groundwater). The impacts of excavation and removal of soil on the water bodies on site and downstream from the site have not been evaluated in the DEIS.

Vegetation Removal

The ground surface will be cleared (and all existing vegetation removed) over two-thirds of the site for some alternatives and over half the site for others. Vegetation takes up a significant proportion of the precipitation on site through transpiration. An average estimate of the amount of water taken up through evaporation and transpiration is half the annual precipitation. Removal of the proportion(s) of site vegetation proposed for the project construction will increase the water volume that flows from the as surface water. The impacts to wetlands or downstream surface water bodies from the decrease in transpiration and the associated increase in water flow is not evaluated in the DEIS. (The DEIS states on page 3-17 that "the site is not at risk of flooding ")

Hydrology

Background

The Fairhaven Highlands site has a hydrologic system that is defined by the rocks that transmit water very slowly below the site. There are numerous wetlands accumulated at the ground surface because of the slow capacity for water movement of the underlying rock formations (glaciomarine drift and Chuckanut Sandstone). Shallow, sideways subsurface water movement apparently transports water to the wetlands and down-slope to the streams offsite: Chuckanut Creek and Padden Creek. On site water movement is balanced between the processes of infiltration, shallow subsurface movement and discharge to surface water bodies to form a stable hydrologic system. This system will be significantly modified by the proposed Fairhaven Highlands construction (for all alternatives).

Impacts

Site Clearing

Removal of the significant fraction of onsite vegetation and soils proposed for this project construction will drastically alter the balance between these hydrologic processes. Infiltration will be reduced with the removal of surface soils. Further, shallow subsurface water migration will be drastically reduced with the removal of surface soils and sediments. Transpiration will be reduced with the removal of native vegetation. In addition, filling of the wetlands proposed will reduce the onsite storage for surface water. Together these impacts will increase the amount of surface water flowing to the remaining wetlands, and that flows from the site to the downstream Creeks. Impacts of increased water discharge and flooding to the geomorphology, habitat and resident species of the wetlands and Creeks have not been assessed in the DEIS.

Impervious Surface – Once the site is cleared of soils and vegetation the construction of roads, homes, driveways and walkways will convert 25 to 35% (depending on the alternative) of the ground to an “impervious surface” that rapidly shunts any precipitation falling on it to a stormwater drain system. Stormwater runoff transports high volumes of water at rapid rates to the downstream water bodies. Stormwater runoff is identified in the City of Bellingham 2007 Comprehensive Stormwater Plan to be an existing problem in Padden Creek, which is not considered in the DEIS analyses.

Water Quality

Increase in surface water runoff (associated with site clearing and covering the ground with impervious surface) will also contain pollutants from the activities that will occur on the newly developed site, including: vehicle usage, pet waste, fertilizers and pesticides applications. These contaminants will be transported in the increased amount of surface water runoff generated from the project construction to the wetlands and creeks downstream. While the DEIS acknowledges that an increase in contaminants in stormwater is to be expected from the development, the amount of the pollutants likely to reach down-slope streams and wetlands and the impacts of these pollutants on those water bodies is not defined, calculated or analyzed. Padden Creek and Chuckanut Creek are currently identified by the Department of Ecology as violating water quality standards for fecal bacteria content, dissolved oxygen content, and for Padden Creek only exceeding water temperature criteria. Further water quality degradation of these Creeks is not assessed in the DEIS, nor are the impacts to the resident and anadromous species that reside in the Creeks.