

GEOLOGY AND GEOMORPHOLOGY FACT SHEET



Upper Chehalis Basin Landscape

Photo credit: Anchor-QEA

CHEHALIS BASIN STRATEGY PROGRAMMATIC EIS

This programmatic Environmental Impact Statement (EIS) evaluates options to reduce flood damage and restore aquatic species habitat in the Chehalis River Basin.

These options are made up of actions, grouped into programs called alternatives.

The basin has experienced both major flooding and wide-spread degradation of aquatic species habitat. These problems have continued for almost 100 years without a coordinated response.

The Chehalis Basin Strategy will need to provide a long-term, integrated approach to positively effect change in the Chehalis Basin.

Special accommodations

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Programmatic EIS: How it's different

A programmatic State Environmental Policy Act (SEPA) review considers the effects of a broad proposal or planning-level decisions. The impact assessment in a programmatic EIS is more qualitative than a project-specific environmental review. Mitigation measures are also more general and focus on actions that could be implemented or might be required.

Why are geology and geomorphology important?

The Chehalis Basin encompasses approximately 2,700 square miles and is one of the largest river basins in Washington. Geomorphology, the study of the formation and evolution of landforms, and fluvial geomorphology, the movement and processes of the many rivers in the Chehalis Basin, play a key role in shaping the landscape, providing habitat for aquatic species, and influencing flooding and floodplain characteristics.

The draft EIS looks at how individual actions and combined alternatives evaluated for the Chehalis Basin Strategy would affect or be influenced by geology and geomorphology in the Chehalis Basin. Understanding this relationship is important when considering the benefits and impacts of flood damage reduction actions proposed.

Impacts analyzed, both beneficial and negative

In the draft EIS, Ecology identifies and studies both short- and long-term impacts, whether they are beneficial or adverse. Potential negative impacts are explained and determined to be minor, moderate or significant.

Minor impacts are usually small, and easily mitigated. Moderate impacts are adverse, affect a relatively small area within the Chehalis Basin, and are not likely to exceed regulatory limits or criteria. Mitigation for moderate impacts is thought to be reasonably achievable. Significant impacts affect relatively larger areas and are more severe. Impacts that are considered significant are more likely to exceed regulatory limits or criteria and are difficult to mitigate.

Rock formations at the proposed dam site.



Photo credit: Anchor QEA

Aerial photo of the proposed dam site.

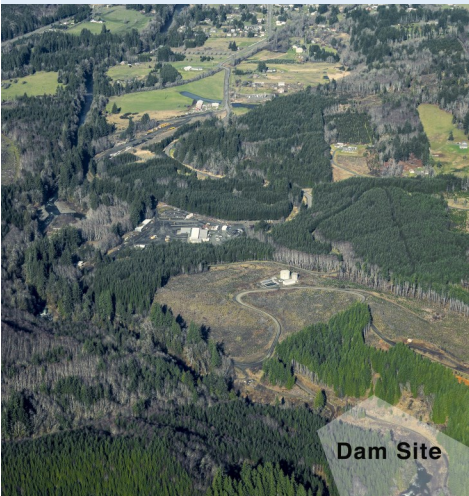


Photo credit: Anchor QEA

Large wood in the Newaukum River: a river feature for aquatic habitat.



Photo credit: Rollingbay Works

Action element impacts: Geology and geomorphology

Impacts to geology and geomorphology from the action elements in the EIS range from beneficial to adverse and significant. Aquatic Species Habitat actions would benefit geomorphology from improvements to river channel structure which create or restore habitat.

Local-Scale Flood Damage Reduction actions could result in minor adverse impacts on geomorphology. However, local projects with bank stabilization elements could cumulatively have a more significant adverse impact, depending on site conditions. Some Large-Scale Flood Damage Reduction actions would benefit geomorphology in the basin, while others could have an adverse impact on geologic and geomorphologic conditions. These adverse impacts could include short-term impacts from construction and long-term impacts from permanent changes to rivers and streams.

How would the combined alternatives in the EIS affect geology and geomorphology?

The main difference between the action alternatives is that each include different Large-Scale Flood Damage Reduction actions. This also creates vastly differing impacts to geology and geomorphology between the alternatives. Two of these Large-Scale Flood Damage Reduction actions have the potential to significantly impact geology and geomorphology.

Alternative 1 includes a dam and either a permanent or temporary reservoir, raising the Chehalis-Centralia Airport levee, and building a levee around low-lying portions of Aberdeen and Hoquiam. Of all of the action alternatives, Alternative 1 would result in the greatest adverse impacts to geology from landslides caused by raising and lowering water levels in a reservoir. A dam would also disrupt geomorphic processes that move sediment and wood downstream. However, a dam may benefit geomorphology where it reduces periodic bank erosion downstream caused when a high flood travels down the Chehalis River.

In comparison, Alternative 2, which includes walls and levees along Interstate 5, would have minor to no impacts on geology or geomorphology. Alternative 3, which includes no Large-Scale Flood Damage Reduction actions, would not likely result in adverse geologic or geomorphic impacts.

Alternatives 2 and 3 would benefit geomorphology more than Alternative 1, because these alternatives include Aquatic Species Habitat actions which would improve river structure, and do not include the permanent and large-scale changes to the Chehalis River and its floodplain caused by a dam and reservoir. Alternative 4 would have the most benefit to geomorphology. By design, the Restorative Flood Protection actions restore natural geomorphic processes by increasing river complexity and sediment and wood retention.

This fact sheet provides a very general overview for public outreach purposes. This summary does not include all aspects of analysis. The detailed analysis, data and findings are available in the draft EIS, Chapters 4 and 5, online at <http://chehalisbasinstrategy.com/eis-library/>.