Winter 2012

Proposed expansion: South Fork Nooksack gravel mine: environmental impact assessment

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Proposed Expansion: South Fork Nooksack Gravel Mine

ENVIRONMENTAL IMPACT ASSESSMENT

Professor: Dr. Leo Bodensteiner

Environmental Studies 436: Environmental Impact Assessment
Western Washington University: Huxley College of the Environment
Winter 2012

A collaborative report constructed by:

Andrew Bohannan
Alyssa Lewis
Rebecca Taber
James Van der Voort
& Marlena Milosevich

This report represents a class project that was carried out by students of Western Washington University, Huxley College of the Environment. It has not been undertaken at the request of any persons representing local governments or private individuals, nor does it necessarily represent the opinion or position of individuals from government or the private sector.
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Authors (print)                  Signature                  Date

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_________________________________________  ________________________________  _____________
Marlena Milosevich
1.0 Dear Concerned Citizen Letter

Dear Concerned Citizen,

The purpose of this Environmental Impact Assessment (EIA) is to assess the probable environmental impacts of rezoning and expanding the current Saxon Pit Gravel mine area on Doran and Bowman Road of Acme, Washington. This document is formatted to comply with the State environmental Policy Act (SEPA) and follows the guidelines issued in Washington Administrative Code (WAC) 197-11-010-968. It has been prepared by a group of students as an academic exercise for Environmental Science 436 under the supervision of Dr. Leo Bodensteiner. This EIA is an academic version of SEPA's Environmental Impact Statement and should not be used as an official document.

The proposed action is for amending the Whatcom County Comprehensive Plan and Zoning Map to create a Mineral Resource Lands designation and zoning overlay. The site is off of Doran and Bowman roads in the South Fork Nooksack Valley, just south of Acme. The company Concrete Nor’West of Burlington, Washington has proposed this amendment with mineral extraction as the future intended land use.

The intent of our assessment is to identify potential environmental impacts of the expansion of the site and mining practices and operation. This document utilizes scientific studies of the environmental impacts of gravel mining, past environmental impact statements on gravel mining in Washington and Oregon, and models to forecast habitat impacts in the future. We hope you find this document an informative assessment of the environmental impacts of expanding the Saxon gravel mine in Acme.

Sincerely,

The South Fork Gravel Expansion EIA Team

Andrew Bohannan, Alyssa Lewis, Marlena Milosevich, Becca Taber, & James van der Voort
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TITLE:

South Fork Nooksack Gravel Mine Expansion Proposal

DESCRIPTION OF PROJECT:

The proposed action is for amending the Whatcom County Comprehensive plan and Zoning Map to create a Mineral Resource Lands (MRL) designation and zoning overlay. The site is off of Doran and Bowman roads in the South Fork Nooksack Valley, just south of Acme. The company Concrete Nor’West has proposed this amendment with mineral extraction as the future intended land use.

LEGAL DESCRIPTION OF LOCATION:

The proposed site is located within the NW 1/4 and NE 1/4 of Section 28, Township 37, Range 5E, W.M. Assessor’s Parcel #’s: 370528 180450 and 370528 461325

PROPOSER:

Concrete Nor’West
663 Pease Road
Burlington, WA 98233

LEAD AGENCY:

Bodensteiner & Associates
516 High Street – MS 9181
Bellingham, WA 98225

PERMITS:

Sand & Gravel Permit for Non-Portable Facilities; Issued by Dept. of Ecology
Surface Mining Reclamation Permit; Issued by Department of Natural Resources
Land Disturbance and Clearing Application; Issued by Whatcom County

CONTRIBUTIONS BY EACH OF THE AUTHORS:

Andrew Bohannan: Maps, Geology, Soils, Plants, Transportation, Public Services & Utilities
Alyssa Lewis: Built Environment, Environmental Health, Editor
James van der Voort: Wildlife-Terrestrial and Fish, Air Quality
Rebecca Taber: Land Use, Permits
Marlena Milosevich: Water, Wildlife-Fish, Habitat
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ACKNOWLEDGEMENTS:

Dr. Leo Bodensteiner, Professor, Western Washington University
Jennifer Paulson, Whatcom County Council Clerk
Josh Fleischmann, Whatcom Planning and Development Services
Melissa Roberts, Whatcom County Public Works
Nicole Brown, Safeguard the South Fork
Jeff Margolis, Everybody’s Store
Amy Martin, Friends of the Nooksack
Lummi Natural Resources Department
Anonymous Citizens of Acme, WA
ISSUE DATE:

March 9, 2012

PUBLIC PRESENTATION DATE & TIME:

March 8, 2012 at 5 o’clock in the evening

The Woods Coffee

470 Boulevard Park Bellingham, WA 98225

(360) 738-4771
3.0 List of Figures & Tables

Figures

1A – Parcel locations and geologic test-bores
1B – Overview map of area surrounding mining pit
1C – Habitat types on mine location
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3A – Soil types of surrounding area
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1A – Typical soil conditions at Saxon site
3A – Vegetative cover by soil type
4.0 Glossary of Technical Terms, Acronyms, & Abbreviations

303(d) Impaired Waters: Under section 303(d) of the CWA, states, territories, and authorized tribes, collectively referred to in the act as "states," are required to develop lists of impaired waters. These are waters for which technology-based regulations and other required controls are not stringent enough to meet the water quality standards set by states. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs), for these waters.

Alluvium: Loose, unconsolidated (not cemented together into a solid rock) soil or sediments, which is then eroded, deposited, or reshaped or re-shaped by water in some form in a non-marine setting.

Aquifer: An aquifer is a wet underground layer of water-bearing permeable rock or unconsolidated materials (rock, sand, gravel) from which groundwater can be usefully extracted using a water well.

Blasting: A term used to describe an intensive process that involves the use of explosives to loosen and divide the surface layer of a quarry.

CWA: The Clean Water Act

EPA: Environmental Protection Agency

GMA: Growth Management Act

HCA: Wildlife Habitat Conservation Areas

A. Habitat conservation areas are those areas identified as being of critical importance to the maintenance of certain fish, wildlife, and/or plant species. These areas are typically identified either by known point locations of specific species (such as a nest or den) or by habitat areas or both. All areas within the county meeting these criteria are hereby designated critical areas and are subject to the provisions of this article (see also Appendix 9.1.1 of this chapter).

B. The approximate location and extent of identified fish and wildlife habitat areas are shown on the county’s critical area maps. These maps are to be used as a guide and do not provide a definitive critical area determination. The county shall update the maps as new fish and wildlife habitat areas are identified.

C. For purposes of this chapter, habitat conservation areas shall include all of the following:
   1. Streams. Streams shall be designated according to the following criteria:
      a. Shoreline streams are those streams identified and regulated as shorelines of the state as defined by WAC 173-18-410 and designated in the Whatcom County Shoreline Master Program (WCC Title 23).

MRL: Mineral Resource Land

PAH: Polycyclic Aromatic Hydrocarbons; common pollutants associated with vehicle-related vapors, leakages, and deposits.

PHS: Priority Habitat Species
Quarries: Open-pit mines that produce building materials and dimension stone are commonly referred to as quarries.

SEPA: State Environmental Policy Act

SFNR: South Fork Nooksack River

TMDL: The Total Maximum Daily Load (TMDL) or Water Quality Improvement Project process was established by Section 303(d) of the Clean Water Act (CWA) to establish limits on pollutants that can be discharged to the water body and still allow state standards to be met.

TSS: Total Suspended Solids

Turbidity: Is the cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye. The measurement of turbidity is a key test to water quality.

4.1: Soil Type Definitions & Characteristics:

ANDIC XEROCHREPTS

Characteristics
Moderate to very deep, well-drained soil on mountainsides, canyon sides, and ridges. Moderate or moderately rapid permeability. Available water capacity moderate or high. Root depth more than 20 in. Water runoff rate medium, hazard of erosion severe. Hazard of erosion due to slope. unsurfaced roads slippery and soft, subject to rutting in wet periods. Following road construction and clear-cutting, road failures and landslides are likely; especially areas underlain by glacial till. Soil creep common. Locating roads requires extensive cutting and filling, which would require moving aggregate to previously mined locations (delaying their restoration), or onto future mining locations (removing that land from production) until those roads have been removed. Restriction to tree rooting depth causes occurrence of wind throws. Seedling mortality rate high on ridge tops due to high, persistent winds. Slope makes planting seedlings by hand difficult.

Mitigation
Proper road layout, skid trails, and proper timing of their use to reduce slope failures. Low pressure ground equipment to reduce compaction of soil profile.

BRANESTON GRAVELLY LOAM

Characteristics
Very deep, somewhat excessively drained soil on outwash terraces. Moderately rapid to rapid permeability, low available water capacity. Rooting depth 60 inches. Slow runoff, slight erosion hazard. Unsurfaced roads are soft during seasonal wetness and subject to rutting. Equipment causes moderate degree of compaction in moist conditions and moderate soil displacement in dry conditions. Erosion hazard during periods of re-establishment. High soil temp and low water content cause high seedling mortality rates.
Mitigation
Reforest by planting Douglas fir seedlings. Proper road layout and proper timing of their use will reduce road damage. Low pressure ground equipment to reduce compaction of soil profile.

BRANESTON VERY GRAVELLY LOAM

Characteristics
Very deep, somewhat excessively drained soil. High permeability, low available water capacity. Rooting depth 60 inches. Water runoff slow, low erosion hazard. High soil temp and low water content cause high seedling mortality rates.

Mitigation
The kind of equipment that can be used and the time of year it can be used are normally not restricted. Reforestation by planting Douglas firs seedlings. Mechanically or chemically control invasion of competing plants in exposed areas.

BRANESTON VERY GRAVELLY LOAM

Characteristics
Very deep, somewhat excessively drained soil on outwash terraces. Moderately rapid to rapid permeability, low or moderate available water capacity. Rooting depth 60 inches. Water runoff slow, slight erosion hazard. Cut and fill slopes tend to ravel when dry. High soil temp and low water content cause high seedling mortality rates.

Mitigation
The kind of equipment that can be used and the time of year it can be used are normally not restricted. Reforestation by planting Douglas firs seedlings. Mechanically or chemically control invasion of competing plants in exposed areas.

BRANESTON VERY GRAVELLY LOAM

Characteristics
Very deep, somewhat excessively drained soil on outwash terraces. Moderately rapid to rapid permeability, low available water capacity. Rooting depth 60 inches. Water runoff rate medium, moderate erosion hazard. Cut and fill slopes ravel when dry. Soil creep common. High soil temp and low water content cause high seedling mortality rates.

Mitigation
The kind of equipment that can be used and the time of year it can be used are normally not restricted. Reforestation by planting Douglas firs seedlings. Mechanically or chemically control invasion of competing plants in exposed areas.

HEISLER VERY GRAVELLY SILT LOAM

Characteristics
Very deep, well-drained soil on mountain back slopes. Moderate permeability, moderate water capacity. Rooting depth 60 inches. Water runoff rate medium, erosion hazard moderate. Slope prevents use of wheeled and tracked vehicles. Roots grow in organic mat; loss of this layer
Proposed Expansion: South Fork Nooksack Gravel Mine

reduces water capacity and natural fertility. Unsurfaced roads soft and slippery, subject to rutting. Cut and fill slope slump when wet. Following roads and clear-cutting landslides are likely. Soil creep common. High soil temp and low water content cause high seedling mortality rates.

Mitigation
The kind of equipment that can be used and the time of year it can be used are normally not restricted. Reforestation by planting Douglas firs seedlings. Mechanically or chemically control invasion of competing plants in exposed areas. Topsoil should be re-established or replaced after operations.

WICKERSHAM CHANNERY SILT LOAM

Characteristics
Deep, well-drained soil on alluvial fans and terraces. Moderate to rapid permeability, as well as moderately available water capacity. Root depth 60 inches. Water runoff rate slow, slight erosion hazard. Topsoil subject to rare flooding and muddiness from seasonal wetness. Use of vehicles on wet surface causes rutting. Unsurfaced roads are slippery and subject to rutting when wet. Extra rock needed to maintain stable surface. Equipment results in high compaction when soil is moist and high degree of puddling when soil is wet. High soil temp and low water content cause high seedling mortality rates.

Mitigation
The kind of equipment that can be used and the time of year it can be used are normally not restricted. Reforestation by planting Douglas firs seedlings. Mechanically or chemically control invasion of competing plants in exposed areas. Low pressure ground equipment to reduce compaction of soil profile.

4.2: Water Quality Assessment Categories:

Category 1 - Meets tested standards for clean waters: placement in this category does not necessarily mean that a water body is free of all pollutants. Most water quality monitoring is designed to detect a specific array of pollutants, so placement in this category means that the water body met standards for all the pollutants for which it was tested. Specific information about the monitoring results may be found in the individual listings.

Category 2 - Waters of concern: waters where there is some evidence of a water quality problem, but not enough to require production of a water quality improvement project (also known as a TMDL) at this time. There are several reasons why a water body would be placed in this category. A water body might have pollution levels that are not quite high enough to violate the water quality standards, or there may not have been enough violations to categorize it as impaired according to Ecology's listing policy. There might be data showing water quality violations, but the data were not collected using proper scientific methods. In all of these situations, these are waters that we want to continue to test.

Category 3 - Insufficient data: water where there is insufficient data to meet minimum requirements according to Policy 1-11.
**Category 4 - Polluted waters that do not require a TMDL:** waters that have pollution problems that are being solved in one of three ways:

- **Category 4a** - has a TMDL: water bodies that have an approved TMDL in place and are actively being implemented.
- **Category 4b** - has a pollution control program: water bodies that have a program in place that is expected to solve the pollution problems. While pollution control programs are not TMDLs, they must have many of the same features and there must be some legal or financial guarantee that they will be implemented.
- **Category 4c** - is impaired by a non-pollutant: water bodies impaired by causes that cannot be addressed through a TMDL. These impairments include low water flow, stream channelization, and dams. These problems require complex solutions to help restore streams to more natural conditions.

**Category 5 - Polluted waters that require a TMDL:** the traditional list of impaired water bodies traditionally known as the 303(d) list. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. TMDLs are required for the water bodies in this category.

**WRIA:** Water Resource Inventory Areas

- **WRIA 01:** Nooksack
- **WRIA 03:** Lower Skagit/Samish
Section 5: Background of the Proposal and Detailed Alternatives
Executive Summary

The purpose of this Environmental Impact Assessment (EIA) is to evaluate the potential impacts of the future mineral extraction for the 280 acre expansion of MRL designation and zoning overlay, proposed for amendment within the Whatcom County Comprehensive Plan and Zoning Map. If the amendments were to be accepted, the 280 acre expansion will be mined for gravel and aggregate by Burlington based company, Concrete Nor’West. This EIA investigates the environmental impacts associated with the proposed action, an alternative action and again for a no action alternative. Impact analysis has been performed in accordance with the State Environmental Policy Act (SEPA).

The applicant is proposing the amendment to the WCCP and Zoning Map to change an existing 280 acre Commercial Forestry zone with a Commercial Forestry designation to an MRL designation and zoning overlay. The proposed 280 acre expansion is adjacent to an inactive gravel pit and is located off of Doran and Bowman roads just South of Acme. The amendment to the WCCP and Zoning Map would result in the 280 acres being mined for gravel and other aggregates. The alternative proposal is to not mine the entire 280 acres but to protect Habitat Conservation Areas (HCA’s) and wetlands as well as reclaiming already exhausted sites and sections of the expanded site as they become exhausted. This would minimize disturbance and impacts of mining processes on the natural and built environments as well as provide some mitigation to those impacts that remain unavoidable. The last option would be to not go through with the proposed amendments, leaving all existing conditions in place. This would mean that the proposed 280 acre expansion would not be actively mined and instead left as Commercial Forestry area.

The impacts of the proposed South Fork Nooksack Gravel Mine are assessed by impact category in the following report. The categories of significant environmental impacts are organized by sections of Natural Environment, Built Environment, and Environmental Health. Impacts we have determined to be most significant fall under the Natural Environment heading, due mostly in part by the general stress on the land mining operations entail. The proposed development would require removal of topsoil and existing vegetation on mining sites as well as the disturbance of topsoil and existing vegetation on sites not being actively mined. During the construction of the mine and the process of actively mining for gravel and other aggregates an increase in on-site transportation will occur in the area, which will cause loosening and compaction of soils as well as a reduction in air quality. Water quality is another factor that may be impacted by mining practices; this includes surface water, wetland habitat, flooding regimes, and groundwater. The proposed mine expansion will have detrimental effects to wildlife and habitat which is intrinsically valuable as well as being a cultural resource to the Lummi Nation and the Nooksack Tribe. The Lummi Nation and the Nooksack Tribe also consider this area an archeological site which makes an archeological survey necessary prior to the mining of the site. At the end of this document you will find a summary of our findings and the recommendation we have developed for the proposal, which is first highlighted in the Decision Matrix found at the end of Section 1.
History of Mining in Whatcom County

Mining activities in Whatcom County have taken place since the 1850's, though the nature, extent, and scope of such activities has changed considerably through time. In Whatcom County, sand and gravel mining occurs mainly east of Interstate-5 and north of Bellingham, with some exceptions. The more important areas from east to west include: (1) the Siper and Hopewell Road area two miles north of Nugents Corner; (2) the Breckenridge Road area just east of Nooksack; (3) the Pangborn and Van Buren Road area two and one half miles southwest of Sumas; (4) the Pole and Everson-Goshen Road area to the southwest of Everson; (5) the Axton Road area one mile east of Laurel; and (6) the Valley View Road area three miles to the east of Blaine. It is estimated that between 1999-2001 approximately 1.73 million cubic yards of sand and gravel from upland pits were excavated annually in Whatcom County (Report Engineering Geology Evaluation Aggregate Resource Inventory Study Whatcom County, Washington (GeoEngineers, Inc., Sept. 30, 2003, p. 7). To address the goals of the Growth Management Act (GMA), Whatcom County formed a ‘Surface Mining Citizens’ Advisory Committee in the 1990’s to produce, through a consensus process, the issues, goals, and policies associated with land use decisions involving mineral resource extraction and preservation. One of the goals of the GMA is to maintain and enhance resource based industries, including the aggregate and mineral resource industries, with the purpose of assuring long-term conservation of mineral resource lands for future use.

Mining has previously occurred at the proposed expansion site under supervision of Concrete Nor’West. In 1978 a sand and gravel mining site was opened at the intersection of Bowman and Doran roads. It was permitted by the Washington State Department of Natural resources under the site name Saxon. The permit was for extraction on 20 acres to a depth of 20 feet. In 1997 a revision was made to the permit to allow extraction to a depth of 25 feet. In September 2008, a permit was issued to expand the site to 41 acres with an allowed depth of 65 feet. In December 2008 the application by Concrete Nor’West was filed in order to expand the MRL designation, changing the commercial forestry designation to MRL and expanding the existing MRL zoning overlay over the commercial forestry zone. In November 2009 the SEPA official issued a Determination of Non-significance.

Environmental issues associated with surface mining include groundwater contamination and disruption of fish and wildlife habitat. Another potential problem is that digging out a sidehill and/or through a clay barrier could tap the groundwater and suddenly drain an aquifer. Mining below the water table, however, can minimize the amount of land disturbed or the occurrence of "mining sprawl" in the county. As mineral deposits are depleted, reclamation to lakes or wetlands can mitigate the displacement of wildlife and have a positive effect on water quality. Associated mining activities such as rock crushing on-site can greatly increase the "industrial atmosphere" experienced by nearby property owners. This activity, however, helps to keep material transportation costs down. In addition, accessory uses are a necessary part of most operations, and to carry them out on site is cost-effective. Surface mines do have the potential, however, if reclaimed properly, to create wetlands and fish and wildlife habitat, productive agricultural land, or provide land for parks, housing, industrial and other uses.
Potential Actions

Proposed Action

Concrete Nor’West is proposing an amendment to the Whatcom County Comprehensive Plan and Zoning Map to expand the existing MRL overlay by 280 acres over an existing Commercial Forestry zone, and change the Commercial Forestry designation to an MRL designation. The proposed expansion is adjacent to an inactive County gravel pit formerly known as the Saxon Pit, on the northern slope of Eddy’s Mountain, at the intersection of Doran and Bowman roads. The proposed site will henceforth be referred to as the South Fork Nooksack Gravel Mine (SFNGM). If the amendments were to be accepted, Concrete Nor’West plans to convert the currently forested land into a mine for the extraction of gravel and other aggregates.

Alternative Action

Wetland/HCA Protection and Reclamation

The alternative action involves two actions which Concrete Nor’West must take in mining the expanded site. The first action is that areas considered to be a wetland or Habitat Conservation Area (HCA) are to not only be exempt from active mining but must also be provided a buffer so as to protect and minimize impacts caused by active mining. Lands that constitute wetlands or HCA’s as well as the required size of protective buffers are defined in Whatcom County Code (WCC), Chapter 16.16 Articles 6 and 7 respectively. The second action required of Concrete Nor’West involves the reclamation of previously exhausted sites (shown on Map 1A) as well as sites being actively mined. Previously exhausted sites will be reclaimed using the post-mining reclamation strategy while sites being actively mined will be reclaimed using the segmental reclamation strategy, which in Washington state is recommended by the Department of Natural Resources (DNR) wherever site conditions permit. Reclaimed mine sites must exceed the minimum reclamation standards required by the Surface Mining Act, with the intent to protect existing wildlife and habitat from possible impacts due to introduction of pollutants or other mining byproducts through runoff and other disturbance. This alternative would take into account all elements of the Natural Environment (see Section 2) and mitigate the impacts of the proposed action. Elements of the Built Environment (see Section 3) may or may not be improved through this alternative, but will still be addressed in the analysis.

Post Mining Reclamation: Involves completing reclamation only after all resources have been depleted from the entire mine.

Segmental Reclamation: Involves completing reclamation following depletion of minerals in a sector of the mine.
No Action Alternative

A no action alternative will also be assessed in this report. In this alternative the amendments to the WCCP and Zoning Map do not expand the existing MRL overlay over the current Commercial Forestry zone and do not rezone the Commercial Forestry designation to an MRL designation. More importantly this alternative does not result in the proposed 280 acre site being mined for gravel and other aggregates. This does not address any future actions which may occur on the already existing Saxon Pit and will not include the analysis of those actions. This alternative will result in the 280 acres of Commercial Forestry zone to remain as is.
### Proposed Expansion: South Fork Nooksack Gravel Mine

#### DECISION MATRIX LEGEND

<table>
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<tr>
<th>No Impact:</th>
<th>Positive &amp; Negative Impacts:</th>
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<tr>
<td>0</td>
<td>+</td>
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<tr>
<th>Large Positive Impact:</th>
<th>Negative:</th>
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#### Natural Environment

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**Earth**

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| Soils | - | - | 0 |
| Geology | - | - | 0 |

**Air**

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| Air Quality | - | + | - | + |

**Water**

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<th>Alternative</th>
<th>No Action</th>
</tr>
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</table>

| Surface Water Quality | - | + | - | 0 |
| Runoff/absorption | - | + | - | 0 |
| Floods | - | + | - | 0 |
| Groundwater Quality | - | + | - | 0 |

**Plants & Wildlife**

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<th>Proposed Action</th>
<th>Alternative</th>
<th>No Action</th>
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| Vegetation | - | - | 0 |
| Wildlife | - | - | + |

**Built Environment**

**Environmental Health**

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<th>Proposed Action</th>
<th>Alternative</th>
<th>No Action</th>
</tr>
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| Environmental Health Hazards | - | + | - | + |
| Noise | - | - | + | ++ |
| Risk of Explosion | - | - | + | ++ |
| Potential Release | + | + | + | ++ |
| Recreation | + | + | - | + |
| Agricultural crops | - | - | + | + |
| Transportation | - | - | 0 |
| Public Services & Utilities | - | - | 0 |

**Land Use**

<table>
<thead>
<tr>
<th>Proposed Action</th>
<th>Alternative</th>
<th>No Action</th>
</tr>
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</table>

| Historical/Cultural | + | - | + | ++ |
| Zoning | + | - | - | - |
Section 6: Natural Environment: Affected Environment, Environmental Impacts and Mitigations
6.1 Earth

Geology

Existing Conditions

The information within this section has been adapted from Concrete Nor’West letter to Brad Barton December 24th, 2008. A full copy of this letter can be found in Appendix Section 9.1.2. Geologic profile maps can be found in Appendix Section 9.0, Figures 4A, 4B, 4C, and 4D.

The surficial geology of the Samish/Nooksack River valley in the immediate vicinity of the project site generally consists of Holocene- age alluvial deposits, glacial deposits of the Fraser Glaciation, and Jurassic-age bedrock. The Fraser-age, glacially derived sediments are up to several hundred feet thick in many portions of Whatcom County. The sediments of the Frasier Glaciation are derived from two glacial advances, the older Vashon and younger Sumas Stades that are separated by sediments of the Everson Interstate, a period of glacial retreat. The Vashon deposits consist of advance outwash sediments that are generally overlain by glacial till. The till was deposited at the base of the advancing glacier and consists of a relatively impermeable, unsorted mixture of silt, clay, sand, and occasional gravel.

During the Vashon Stade (approximately 20,000 to 12,500 years before the present), the glacial ice was several thousand feet thick in Whatcom County, and the glacier advanced as far south as Olympia, WA. During the Everson Interstate (approximately 12,500 to 11,500 years before present), sediments were deposited as the Vashon glacier retreated and the sea level rose. These interstate sediments consist of glacial and marine outwash deposits, beach deposits, and glaciomarine drift. The glacial outwash sediments consist of loose, moderately to well-sorted cobbly gravel, gravelly sandy, sandy gravel, sand, and rare silt. The glacial ice extended a short distance into northern Whatcom County north of the Saxon MRL during the Sumas Staded (approximately 11,500 to 10,000 years before present). This slight reversal of the Everson ice retreat resulted in the local deposition of glacial till, marine deltaic outwash, and glacial outwash sediments over older Everson and Vashon glacial sediments in a large portion of Whatcom County, including the area the includes the Saxon MRL and proposed expansion area.

Holocene alluvial fans (Qaf) formed at various locations within the Samish/Nooksack River Valley following the retreat of the Sumas glacier. Recent alluvial sediments (Qa) associated with the present day Samish and South Fork Nooksack Rivers are present beneath the valley floor surrounding the Saxon MRL.

- The geologic conditions of the Saxon MRL and proposed expansion area are primarily the result of the folding/faulting of bedrock units and several regional glacial events.
- The bedrock the forms Eddys Mountain located just south of the MRL is part of the Jurassic-age Easton Metamorphic Suite of Tabor and others, which includes the Farrington Phyllite and semischist of Mount Josephine and Shuksan Greenschist. These formations are comprised of weakly metamorphosed quartzose-graphitic phyllite, shale, slate, chert, mudstone, coarse conglomerate, and volcanic rocks.
- The upland surface area that includes the proposed expansion area and the Saxon MRL are interpreted to be covered at the ground surface by Sumas Stade and/or Everson Interstade glacial outwash deposits (Qgo). The outwash unit generally consists of loose, gravel with local boulders, cobbly gravel, gravelly sand, sandy gravel, sand, and rare silt
• The Sumas and/or Everson-age outwash may overlie older Everson glaciomarine drift (Qgdm) or Vashon till (Qgt) at depth. The Sumas/Everson-age outwash is the target mining geologic unit and appears to be at least 40 to 100 feet thick in the vicinity of the MRL and the northern portions of the proposed expansion area, thinning to the south, on the slopes of Eddys Mountain.

• The Sumas/Everson-age outwash sediments are grade into lated Holocene Samish/Nooksack River alluvium (Qa) just to the west, north, and east of the MRL.

**Proposed Action**

Active surface mining will degrade slope stability via undercutting and loosening of soil structure from large equipment shaking. Additionally, a large amount of the geologic material will be moved or removed, resulting in a net loss of geological mass and the nutrients associated with it. For a further description of the hazards of soil creep and mass-sliding see section 1.2.

**Alternative Action**

Initial conditions described in the proposed action will exist temporarily, until mitigation measures are completed. Re-establishment of vegetation is the most efficient way to re-establish natural soil conditions (including stability and nutrient content). [See section 1.2 for descriptions of how to re-vegetate the land surface according to soil type for the given area]

**No Action Alternative**

The no action alternative will result in no change in geologic conditions.

**Soils**

**Existing Conditions**

According to USDA Soil Survey of Whatcom County Area, Washington the existing southeast site fully sits on soil type #3. The existing northwest site sits on soil type #6, with an eastern edge of soil type #8. The land within the new development area intended to be left idle sits on soil types #6, 7, 8, and 9. The land within the new development area intended to be mined sits on soil types #6, 7, 8, 9, and 69, with a small insert in the south west of soil types #3 and #185. (See Figure 3A) Soil surface and profile are undisturbed, excluding areas near roads and on previously mined sites.

The existence of these soils within the development site can be used to extrapolate the “suitability and potential of a soil for specific uses. They can also be used to plan the management needed for those uses.” (Whatcom Soil Survey) Table 1A displays soil types with typical conditions.
Table 1A: Typical Conditions of Soils at Saxon Site

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Slope</th>
<th>Gravel</th>
<th>Roadfill</th>
<th>Average Annual Precip.</th>
<th>Mean Annual Temp</th>
<th>Frost Free Days</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>#3</td>
<td>60-90%</td>
<td>improbable:</td>
<td>poor:</td>
<td>50 in.</td>
<td>46°F</td>
<td>130 days</td>
<td>volcanic ash, colluvium derived from glacial till, sandstone, and metasedimentary rocks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>excess fines</td>
<td>depth to rock, slope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#6</td>
<td>0-8%</td>
<td>improbable:</td>
<td>fair:</td>
<td>60 in.</td>
<td>49°F</td>
<td>160 days</td>
<td>Loess and volcanic ash over glacial outwash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>large stones</td>
<td>large stones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#7</td>
<td>8-15%</td>
<td>improbable:</td>
<td>fair; Large stones</td>
<td>60 in.</td>
<td>47°F</td>
<td>160 days</td>
<td>Loess and volcanic ash over glacial outwash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large Stones</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#8</td>
<td>15-30%</td>
<td>improbable:</td>
<td>fair:</td>
<td>60 in.</td>
<td>47°F</td>
<td>160 days</td>
<td>Loess and volcanic ash over glacial outwash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>large stones</td>
<td>large stones, slope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#9</td>
<td>60-60%</td>
<td>improbable:</td>
<td>poor:</td>
<td>60 in.</td>
<td>47°F</td>
<td>160 days</td>
<td>Loess and volcanic ash over glacial outwash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>large stones</td>
<td>slope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#69</td>
<td>30-60%</td>
<td>improbable:</td>
<td>poor:</td>
<td>60 in.</td>
<td>47°F</td>
<td>170 days</td>
<td>Loess and volcanic ash over glacial till high in phyllite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>excess fines</td>
<td>slope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#185</td>
<td>0-3%</td>
<td>probable</td>
<td>good</td>
<td>60 in.</td>
<td>49°F</td>
<td>170 days</td>
<td>derived from alluvium dominated by phyllite</td>
</tr>
</tbody>
</table>

**Proposed Action**

The process of mining removes topsoil and disturbs soil profiles. There would be an increase in water permeability rates due to removal of less-permeable upper layers. Slope stability would degrade, resulting in possible landslides or other mass movements. Water runoff and erosion rates would increase along roads as is the case with any road instillation. Increased occurrence and severity of all warnings described in Soil Description section 1.2.

**Alternative Action**

The rate of soil profile and topsoil regeneration would increase due to the presence of replanted soil-establishing vegetation and the invertebrates, bacteria, and fungi associated with said vegetation. Water permeability rates would decrease due to the increased input of organic matter from replanted vegetation. Shortly after re-vegetation, root growth will begin to re-stabilize slopes put at risk by undercutting and other mining processes. Roads undergoing restoration processes such as replanting or dispersal of organic matter would result in reduced water runoff and erosion rates. Further mitigation strategies for specific soil types are described in Soil Description section 1.2.
No Action Alternative

Taking the no action alternative would result in no changes to the current soil conditions.

Topography

For a detailed map of topography for the region see Figure 1A. Highlighted areas will undergo topographical changes as a result of mining, resulting in a flatter landscape with steeper slopes along the edges.

Unique Physical Features

The site is located along and on the northern slope of Eddy’s Mountain. The Nooksack River runs along the eastern border of the site. The Samish Creek runs along the western border of the site.

Erosion/Enlargement of Land Area (Accretion)

See Soil Type Definitions and Characteristics section 4.1.

6.2 Air

Air Quality

Existing Conditions

The project site is just south of the city of Acme and the surrounding area is rural with prominent agriculture and forest features. The gravel pit immediately adjacent to the project site is inactive and has been for some time. This creates an area of high air quality with limited amounts of particulate matter and greenhouse gases present. The particulate matter and greenhouse gases that are present in the air are mainly produced from residential traffic and agricultural machinery. The agencies that oversee air quality in this area are the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (DoE), and the Northwest Clean Air Agency (NWCAA) which is the regional air quality control branch of the DoE. NWCAA has primary permitting responsibility related to air quality issues and has adopted the ambient air quality standards found in the National Ambient Air Quality Standards of the Clean Air Act (EPA). For human health, the EPA considers airborne particulate matter that is smaller than or equal to 10 micrometers (µm) in diameter as a main health concern because these particles can be inhaled deeply into the lungs. Particulate matter that is smaller than or equal to 2.5 µm in diameter is also of importance as particulate matter of this size is also detrimental to human health. The DoE and NWCAA maintain and operate a system of air quality monitoring stations throughout Island, Skagit and Whatcom Counties. These stations monitor air quality using the Washington Air Quality Advisory (WAQA)
to inform people about the health effects of air pollution (DoE). The WAQA is not a regulatory tool, but instead a way for people to know when air quality is unhealthy so that they may protect themselves. The WAQA is rated on a scale of 0-500, 0-50 being good air quality and not requiring any activity restrictions. As the index increases air quality is decreased and health risks to humans increase, with the range from 301-500 being considered hazardous and a recommendation of people staying indoors and shutting windows and doors to avoid adverse health impacts. The WAQA indexes measured at the stations around the project site fall in the 0-50 range all indicating good air quality. The stations looked at are the Bellingham, Mount Vernon, Darrington, and Custer sites (DoE). These stations, however, are in areas that are more urbanized than the project site, and the WAQA of the area near the project site can be assumed to be lower due to less urbanization.

**Proposed Action**

The proposed action would involve deforestation, increased industrial traffic, and increased mining machinery. These actions as well as the active mining processes will increase the amount of particulate matter in the air. The increased particulate matter could have potential negative impacts on local human health, agricultural crops, as well as wildlife health. Therefore the proposed action has a high potential for significant adverse effects to air quality, and thus is not recommended.

**Alternative Action**

The alternative action involves similar impacts as the proposed action. An increase in particulate matter will occur due to mining on site involving some deforestation, increased industrial traffic, increased mining machinery and active mining processes. These impacts would be somewhat mitigated by the areas on the site left alone as protective buffers for HCA's and wetlands. The areas left as forest could potentially act as buffer zones for air quality allowing some of the particulate matter to get caught in trees instead of being carried by wind into residential areas and agricultural lands. This however could have negative effects on the sections of the site that are supposed to be left alone to minimize disturbance. The portion of the proposed site that will be actively mined will be smaller in the alternative action than in the proposed action, which translates to less particulate matter being emitted. The alternative action could potentially still increase the WAQA index in the area, decreasing the air quality, and is thus not recommended due to the negative effects to the residents, wildlife, and agriculture in the surrounding area.

**No Action Alternative**

The no action alternative does not involve active mining and therefore will not increase deforestation, industrial traffic, or the presence of industrial machinery. The site, being left as Commercial Forest land, could potentially benefit the air quality of the surrounding area with continuous growth of vegetation present, including Red Alders planted as reclamation of inactive Saxon Pit.
6.3 Water

Surface Water Movement, Quantity, Quality

Existing Conditions

The gravel mine site is located between a watershed divide which consists of the Nooksack River Basin (WRIA 01) and the Samish River basin (WRIA 03). The site is located between the South Fork of the Nooksack River to the Northeast within 0.125 miles and the Samish River to the West within 0.625 miles. The Nooksack River Basin drains to the Northwest into Bellingham Bay in Whatcom County while the Samish River Basin drains to the Southwest into Samish Bay in Skagit County. Also present on the location of the project is a stream that is presumed to have potential or historically provided habitat for a distribution of salmonids.

The Nooksack River is considered a HCA 1A Stream with current known salmonid distribution. The SFNR has a number of important water quality issues such as instream flow, fine sediments, temperature, dissolved oxygen, fecal coliform, and pH.

Under the CWA 303(d) listing the SFNR is listed as a category 4c for instream flow, which means that the river is impaired by a non-pollutant. Minimum flows set by WAC were not met an average of 81% of the time between June 1 and October 31. Low summer and fall flows impact spring and summer Chinook stocks that require deep holding pools with consistent flows. Spring-Summer Chinook, Spring-Summer Coho, Winter Steelhead, Summer Steelhead and Sea-run Cutthroat are all stocks considered to be at risk for extinction.

The SFNR is also listed as a Category 5 for fine sediments (TSS) which means that Ecology has data showing that the water quality standards have been violated and that a TMDL or pollution control plan is required and needed for this body of water.

For water temperature, the S.F. Nooksack is also listed as a category 5. “Lummi Nation unpublished data at station LNT-2490 (submitted by Sue Blake of Whatcom County on 17 December 2002) shows a 7-day mean of daily maximum values of 20.9 degrees C from continuous measurements collected in 1996.”

For both dissolved oxygen and fecal coliform, the SFNR was also rated as a category 5 streams. Ten percent or more of the samples collected for dissolved oxygen analysis in a single year were an exceedance of the criterion, and at least 3 exceedances exist from all data considered. A fecal coliform TMDL was approved in August of 2008 for the Nooksack River. The category was determined by exceedances of the fecal coliform percent criteria.

The SFNR was rated as a Category 2 for pH which means that it is a water body of concern for this parameter. There is some evidence of water quality problems but not enough to require a TMDL because at least 10 percent of the samples collected exceeded the criteria in at least one year but fewer than 3 exceedances exist from all the data considered.
The Samish River also has a number of important water quality issues similar to the SFNR. The Samish River is rated a Category 5 stream for fecal coliform, dissolved oxygen, temperature, and turbidity. The maximum exceedance for the river was 20.79 degrees C for the 7-day period ending July 27, 2006. For turbidity, 5 exceedances of the standard out of 12 samples were derived from the difference between the upstream station 03B080 (Samish R. near Prairie) and the downstream station 03B050 (Samish R near Burlington).

**Proposed Action**

With the proposed gravel mine there is the possibility of adversely affecting the nearby SFNR and the Samish River. Gravel mines may contribute to increased peak flows in nearby streams because of removal of vegetation that absorbs and deflects rain. These peak flows can destabilize stream channels, degrade aquatic habitat for the numerous endangered and threatened salmonids, and contribute to downstream flooding.

Gravel mining can lead to increased erosion which would lead to the increases of both dissolved and suspended solids in nearby streams and rivers. Storm water will suspend exposed soil from mining operations and then carry it to nearby surface waters such as the Nooksack and Samish River. This would have a negative impact on the SFNR because the river is already listed on the 303(d) list for fine sediments.

Exceeding the maximum standard for fine sediments in rivers contributes to salmon red failures. Fine sediments fill the interstitial spaces between spawning graves suffocating salmon eggs leading to decreased numbers of salmonid populations which are listed as endangered or threatened species. Fine sediment increases would also affect salmonid populations in the same way in the Samish River. Increased sediment in streams also increases the difficulty of finding food for salmonids and has the possibility of blocking adult salmonid gills causing them to suffocate and die.

**Alternative Action**

By returning previously mined land back to above and beyond the standards of the Mining Reclamation Act pollutants and fine sediments would be prevented from entering nearby streams and rivers. Increased vegetation increases the amount of storm water filtration before the storm water enters nearby water bodies. This increased filtration would be beneficial to nearby water bodies and organisms residing in them.

**No Action Alternative**

The current 40 acres of open pit gravel mine is open to storm water runoff into nearby stream which could increase fine sediments and pollutants it those nearby streams. The rest of the land is covered with vegetation which is positive for nearby streams in filtering storm water.
Runoff, Absorption

Existing Conditions

Wetlands are areas where water covers the soil or is present either at or near the surface. The function of wetlands is to filter harmful pollutants from storm water, prevent floods and erosion, and to provide food and habitat for numerous species.

Currently there are accessible wetlands that are forested and non-forested on the North portion of the site and a few located throughout the rest of the site. Specifically on the North section of the project site there are PHS wetlands.

Proposed Action

In order to mine certain sites, wetlands would have to be removed to access underlying gravels and sand. The removal of wetlands could possibly increase flooding in the nearby streams and increase sediment deposition and the flow of pollutants into nearby streams harming endangered and threatened salmonid populations. Critical wetland habitat for certain species would also be lost with the mining of the project site.

Alternative Action

By restoring previously mined areas to above the standards of the Mining Reclamation Act, current wetlands on the site could be improved to let more volumes of water infiltrate through the system creating increased prevention of pollutants entering nearby water bodies. Threatened and endangered surrounding wetland species would also benefit from the increased habitat function.

No Action Alternative

With no action the current wetlands would continue to filter pollutants form storm water preventing those pollutants and further sedimentation from entering nearby water bodies.

Floods

Existing Conditions

Over half of TWP 37N Range 5E 21 is considered an area inundated by 100 year flooding. There are also flood-ways which are areas “that must be reserved in order to discharge the base flood without cumulatively increasing the water-surface elevation by more than a designated height” to the West, East, and North of the project site.
Proposed Expansion: South Fork Nooksack Gravel Mine

Proposed Action

The proposed project could possibly increase flooding events with the removal of vegetation and the top layers of soil to reach gravel and sand. Vegetation and the top layers of soil help infiltrate and store water from rain events and gradually return storm water to nearby water bodies. Without these natural filters storm water would have nowhere to go but into nearby streams increasing peak flows and the possibility for flooding downstream.

Alternative Action

By restoring the landscape to beyond the standards of the Mining Reclamation Act, more vegetation would intercept excess storm water and prevent large amount of water from entering nearby streams all at once. This action would decrease the threat of flooding downstream in nearby rivers.

No Action Alternative

The current amount of flooding in surrounding areas would remain the same.

Groundwater Movement, Quantity, Quality

Existing Conditions

TWP 37N Range 5E 21 and about 25% of TWP 37N Range 5E 28 is surficial aquifers (mainland only). To the West, North, and East of the project site there are surficial aquifers which are unconsolidated sand and gravel (mainland only). The aquifer susceptibility of the project area has not been assessed. However, slightly to the North along the Nooksack there is a high grading of aquifer susceptibility.

Proposed Action

Gravel mines tend to concentrate groundwater and thus can alter ground water flows. When vegetation and top soil are removed in the mining process, rain which would otherwise be absorbed, deflected, and infiltrated into ground water, flows into nearby surface waters. Vegetation and soils provide filtration, chemical and physical reactions, and biological activity that removes pollutants before they can enter the groundwater. Gravel mining also increases dissolved and suspended solids in aquifers degrading water quality because mining leads to increased erosion which can potentially enter aquifers. Nearby wells may be affected by gravel mining if pollutants enter the groundwater.

Alternative Action

By enhancing the project site beyond the standards of the Mining Reclamation Act, filtration of pollutants entering groundwater would be increased. This increase in filtration of pollutants would improve groundwater quality and nearby streams that are fed by groundwater.

No Action Alternative

There would be no change to groundwater with no action being taken.
6.4 Plants and Wildlife

Habitat

Existing Conditions

On the proposed site there are a number of different wildlife habitats including grasslands and forested land (see section 2.4 plants and wildlife, Plants for plant descriptions). Wetland habitat that is considered priority habitat is also found on the project site (see section 2.3 Water, Wetlands for wetland descriptions). Most of the site is covered by evergreen forest with some mixed forest.

Near the proposed site are riparian zones and river habitat. To the northwest of the location is the SFNR which is considered an HCA 1a Stream with current known salmon distribution (see section 2.3 Water, Surface water for river description).

The entire site is located in an area that is considered to have habitats and areas associated with a state priority species, Roosevelt Elk (HCA 3).

Proposed Action

The proposed gravel mine may have adverse effects to wildlife habitat from the clearing of vegetation and the top layer of soil. These actions not only destroy terrestrial animal habitat but also effect aquatic animals such as fish through erosion which leads to increased sedimentation in nearby water bodies.

Alternative Action

With the alternative action wildlife habitat would still experience adverse effects associated with the proposed action but these effects would be less harsh due to the mitigation being done. The mitigation would be accomplished through the buffering of HCA’s and wetland areas, as well as the reclamation of exhausted mining sites. A key to this mitigation is that the reclamation will be performed to standards beyond the minimum requirements of the State Reclamation Act.

No Action Alternative

There would be no adverse effects due to mining due to the fact that with no action the site will stay Commercial Forestry zone.
## Plants

**Table 3A**: Soil types present at location with common vegetation found on given soil type. Table based on Whatcom County Soil Survey, not based on observed conditions.

<table>
<thead>
<tr>
<th>Soil type</th>
<th>Woodland Species</th>
<th>Understory Species</th>
<th>Site Index (Douglas Fir)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#3</td>
<td>Douglas fir, limited: western hemlock, western red cedar, red alder</td>
<td>Oregon grape, salal, western swordfern, red huckleberry, vine maple&lt;br&gt;Mat of needles, leaves and twigs 3 in thick</td>
<td>100 yr: 140 ft&lt;br&gt;50 yr: 107 ft</td>
</tr>
<tr>
<td>#6</td>
<td>Douglas fir, limited: western hemlock, western red cedar, red alder, bigleaf maple, shrubs</td>
<td>Oregon grape, salal, western swordfern, western brackenfern, red huckleberry, vine maple&lt;br&gt;Mat 2.5 in thick.</td>
<td>100 yr: 150 ft&lt;br&gt;50 yr: 118 ft</td>
</tr>
<tr>
<td>#7</td>
<td>Douglas fir, western hemlock, western red cedar, red alder, bigleaf maple,</td>
<td>Oregon grape, western swordfern, western brackenfern, red huckleberry, vine maple, &lt;br&gt;Mat 3 in thick</td>
<td>100 yr: 150 ft&lt;br&gt;50 yr: 118 ft</td>
</tr>
<tr>
<td>#8</td>
<td>Douglas fir, western hemlock, western red cedar, red alder, bigleaf maple,</td>
<td>Oregon grape, salal, western swordfern, western brackenfern, red huckleberry, vine maple&lt;br&gt;Mat 2 in thick</td>
<td>100 yr: 150 ft&lt;br&gt;50 yr: 118 ft</td>
</tr>
<tr>
<td>#9</td>
<td>Douglas fir, western hemlock, western red cedar, red alder, bigleaf maple,</td>
<td>Oregon grape, salal, western swordfern, western brackenfern, red huckleberry, vine maple&lt;br&gt;Mat 6 in thick</td>
<td>100 yr: 150 ft&lt;br&gt;50 yr: 118 ft</td>
</tr>
<tr>
<td>#69</td>
<td>Douglas fir, western hemlock, western red cedar, red alder, bigleaf maple,</td>
<td>Western swordfern, oregon grape, red huckleberry, deer fern, Pacific Trillium, bedstraw, salal.&lt;br&gt;Mat 4 in thick</td>
<td>100 yr: 165&lt;br&gt;50 yr: 127</td>
</tr>
<tr>
<td>#185</td>
<td>Douglas fir, red alder, paper birch, western red cedar, western hemlock, bigleaf maple</td>
<td>Elderberry, salmonberry, vine maple, rose</td>
<td>100 yr: 171 ft&lt;br&gt;50 yr: 130 ft</td>
</tr>
</tbody>
</table>
Proposed Action

All vegetation on mining locations will be removed. Species in locations not being mined will be stressed due to reduction of buffer zones (increase in edges), increased ground-level exposure to sun, changes in surface and ground water flow, loss of upslope topsoil and organic matter input, loss of pollinator and other animal traffic, increased windfalls from reduced buffers, increased erosion and soil loss, and possible mechanical disturbance from slumping or landslides.

Alternative Action

Active mining locations will have to remove all existing vegetation, however if vegetation is restored after mining completion then all adverse impacts would be reduced or significantly reduced.

No Action Alternative

No changes in vegetation would occur. Land recovering from previous mine is undergoing secondary ecological succession slowly due to minimal species diversity (all Red Alder), grid layout, and poor soil quality.

Terrestrial Wildlife

Existing Conditions

The project site is characterized as a temperate evergreen forest with some grassland areas which supports a variety of wildlife. Residents have commented that they often enjoy watching wildlife on or near the site and have noted the presence of Oregon spotted frog, bald eagle and northern goshawk. This section will assess the potential impacts to terrestrial wildlife species listed or proposed for listing under the Endangered Species Act (ESA), or species listed by the state, tribes, or Whatcom County as sensitive.

The Oregon spotted frog is a listed as endangered in Washington State and is a candidate for Federal endangered listing. The Oregon spotted frog inhabits wetlands associated with lakes, ponds and slow-moving streams. The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) database shows records of the frogs inhabiting shallow bodies of water near the proposed site as breeding areas. The Oregon spotted frog has not been documented on the project site, but as it is listed as endangered in Washington State and is listed by the WDFW as using nearby wetland areas as breeding grounds this species should be considered significant for the proposed action.

The northern goshawk is listed as a species of concern at the Federal level and is a candidate for endangered species listing at the state level. According to the Seattle Audubon Society, the northern goshawk is known to inhabit mature coniferous forests, preferring forests on moderate slopes at mid- to high elevations. The WDFW PHS database has goshawks listed as present near the proposed project site and with known nests listed to the south and the east of the site. Since this species has not been found on the proposed site, and is not listed as endangered at the state or Federal level it is of low significance to this project.
The bald eagle has been federally delisted from endangered to a species of concern and is listed as sensitive in the state of Washington. Bald eagles use the freshwater sources for feeding seasonally on the salmon, which has been witnessed by local residents and EIA team members on site trips. Eagles have also been spotted flying around the site. No nest sites have been documented in the immediate vicinity of the site, but the eagles have been spotted by local residents following the spawning of local fish species. Due to the seasonal occurrence and lack of documented nesting sites the project site is not considered a major bald eagle nesting territory. Therefore the proposal is not likely to adversely affect bald eagles.

Some wildlife and habitat are protected under the Whatcom County Code (WCC). According to WCC 16.16.710 (see Appendix 9.1.1) the proposed project site contains priority habitat for Roosevelt Elk. Elk are mainly grazers eating grasses and various flowering plants in spring and summer. In fall the elk become browsers eating low shrubs and trees when food tends to become scarcer. The elk are noted as an aesthetic pleasure by local residents and are listed as a priority species under the WCC. Therefore Roosevelt Elk are considered significant for the proposed action.

The Common Loon, harlequin duck and other cavity nesting ducks have been found near the project site but have not been documented within site boundaries. Although these species have not been witnessed within site boundaries, they are waterfowl that migrate along the Pacific Flyway which includes the project site; however the project site covers only a portion of the Pacific Flyway which is not of significant size. These birds are not state or federally listed as endangered species. Therefore these species are not a significant impact to the proposed action.

Proposed Action

Active surface mining requires the deforestation and removal of topsoil from the proposed site which will lead to reduction in available habitat to wildlife as well as degradation to surrounding habitats. The bald eagle is not likely to be significantly impacted by the project due to the lack of key habitat within the project site. Bald eagles, most likely, would easily adapt to avoid mining locations; however this is also moderated by:

- Similar hunting grounds being abundant in the area
- Local bald eagles appear to be adapted to human activities
- The proposed action allows for perches and riparian area to not be affected, and in these sections bald eagle activity would be very similar to what it is now

Since the northern goshawk is not expected to be found in the project site, the species is not likely to be affected by this project. The Oregon spotted frog, although not expected to be found within the project site, is of state and Federal significance and thus is a significant factor of the proposed action. Additional research into the presence of both the northern goshawk and the Oregon spotted frog should be conducted within the project site.

The Roosevelt Elk is a priority species that has been documented by nearby residents as well as by the WDFW in regular concentrations in and around the project area. The removal of forest and natural vegetation would directly impact the elk by removing natural habitat as well as food sources. The decrease in food and habitat could adversely impact populations. Active mining would also cause noise and activity that could disturb elk, to the point of causing emigration by local individuals or groups.
The proposed action is not likely to adversely affect the harlequin duck, common loon and cavity nesting ducks. Although active mining would result in increased noise and deforestation, the lack of sightings within the project site suggests that there would not be significant adverse effects.

**Alternative Action**

Impacts would be similar to those under the Proposed Action. Impacts are likely to be less damaging due to a smaller portion of the project site being actively mined. The reclamation of previous mine sites would benefit the wildlife but a time lag would exist due to the decades needed for reclaimed sites to become fully forested or returned to fully functional wetlands once again. The protection of current wetlands and HCA’s would benefit wildlife by providing a refuge for species displaced from their natural habitat by mining activities.

**No Action Alternative**

Local wildlife would not be affected if no action was taken. Wildlife and habitat would continue to exist as is.

**Fish**

**Existing Conditions**

The Washington Department of Fish and Wildlife (WDFW) identify eight fish species that could potentially be impacted by the proposed action; bull trout, Chinook salmon, Chum salmon, resident coastal cutthroat trout, Coho salmon, Pink salmon, Sockeye salmon, and Steelhead.

Bull trout are listed in the WDFW Priority Habitats and Species (PHS) database as having breeding areas near the project site. This species of fish is federally listed as a threatened species. The bull trout have some of the most specific habitat requirements of salmonids, embodied in what the U.S. Fish and Wildlife Service (FWS) refers to as the “Four C’s”: Cold, Clean, Complex and Connected habitat. The Clean aspect is of importance to this site stating that these fish “require the cleanest stream substrates for spawning and rearing” (FWS). With the proposed action, sedimentation in the South Fork Nooksack River (SFNR) could potentially increase which would have significant impacts to the breeding grounds of this federally threatened species making this a significant factor in this project’s assessment.

Chinook salmon are present in the SFNR and according to the WDFW PHS database use the river as a breeding area. The WDFW Salmonid Stock Inventory (SASI) database lists the Chinook salmon stock present in the SFNR as critical. The Puget Sound evolutionarily significant unit (ESU), in which the SFNR spring Chinook occur, is listed as threatened by FWS. This makes the SFNR a very important habitat for the Chinook salmon, and the proposed action would have significant adverse effects on this species.

Coho salmon are present in the SFNR and are listed in the WDFW PHS database as using the river for breeding and migrating. According to the Shared Strategy for Puget Sound, the Coho salmon found in the SFNR are a candidate for being listed under the ESA with other Coho salmon stocks being listed as endangered or threatened at the Federal level. The Skookum Creek Hatchery is a little ways up river on the SFNR and every spring they release yearlings from their Coho stock to mature and migrate to sea.
The Coho present in the SFNR are not only important to the species itself but also as a cultural resource to the Lummi Nation, therefore this species is considered significant to this project proposal and could potentially be adversely affected by active mining on the project site.

Chum salmon, Pink salmon, Sockeye salmon, resident coastal cutthroat trout and steelhead are present in the Nooksack Watershed but have not been documented in the SFNR and thus are not expected to be significantly impacted by the proposed action. The SFNR is one of the main tributaries of the Nooksack River however, and potential increases in sediment loads could have adverse effects on these fish species downstream. We recommend surveys be performed downriver of the project site to assess potential adverse effects on other fish species not directly impacted at the portion of the SFNR adjacent to the proposed site.

**Proposed Action**

Active mining on the project site would involve the removal of topsoil and vegetation. This could potentially increase runoff and sediment load in the SFNR which would degrade breeding habitat as well as migration routes for all eight fish species mentioned in this section. This assessment has concluded that these effects would have significant impacts to three of these eight species, bull trout, Chinook salmon and Coho salmon. As two of these species are federally listed as threatened with the third species being a candidate for Federal ESA listing, the proposed action is not recommended due to the significance of these three species. The proposed action could potentially affect the five other fish species present in the Nooksack Watershed (listed above), the significance of the impacts to these fish found further down-river has not been studied in this report but is recommended for study if mining is to occur on the proposed site.

**Alternative Action**

The alternative action would have impacts similar to those mentioned in the proposed action, but with the mitigation to exhausted mine sites and protection buffers of HCA’s and wetlands these impacts are not expected to be as significant. Since the fish species present in the SFNR are either listed as either threatened or considered a candidate for listing federally, the alternative action is still not recommended as it will incur negative impacts on these fish species.

**No Action Alternative**

The No Action alternative is recommended as it will have the least amount of impact on the fish species in the SFNR and Nooksack Watershed. If the site is left as Commercial Forestry zone the SFNR will not suffer negative effects associated with mining.
Section 7: The Built Environment: Environmental Health & Land Use
7.1 Environmental Health

Noise

Existing Conditions

Noise levels in the Saxon Rd. area are currently limited to residential vehicle traffic and farming equipment. Because no mining has occurred on the existing gravel site since operation was halted, noise disturbance to native animals and neighboring property owners has been minimal.

Proposed Action

Sand and gravel mining involves the operation of heavy equipment for extended periods each day. The operation of this equipment can generate noise, which could potentially impact nearby residents. In addition, the increased number of trucks and vehicle traffic travelling to and from the site will no doubt add to the overall noise level. Current Whatcom County and Washington State noise ordinances regulate only broad-band noise (Whatcom Co. Charter, Ch. 3.4.1), which measures loudness in terms of frequency and duration. Therefore, mining activities have the potential to exceed that regulation.

Alternative Action

By reclaiming the areas not in active use, issues associated with noise will be less severe. Replanting a variety of tree species, filling previously mined holes, and subsequently leveling out old gravel valleys will help create a buffer to deal with the operational noise within a typical work week. Residents located near the site will benefit from this natural sound barrier, as well as any wildlife that otherwise be disturbed.

No Action Alternative

If no changes were made to the existing site and conditions, then noise levels would stay the same, causing no additional disturbance for nearby wildlife and residents.

Risk of Explosion

Existing Conditions

Without an active mine in operation, there is currently no risk of explosion associated with the site.

Proposed Action

Surface mining is an intensive process that often involves the use of explosives to loosen and divide the top layer of rock. This procedure is commonly referred to as “blasting” and requires trained specialists and contractors to perform properly. Poorly designed blasts can result in misfires, early ignition, and flying rock. Blasting is a planned component of the mining process; therefore risk is limited to the time of
operation only. Blasting materials, chemicals, and components are not left on site in accordance with best management practices and emergency management procedures. Noise and rock debris associated with the initial blasts have the potential to affect native animals and neighboring residents. Rock and dust particles may travel outside of the mining area’s boundaries and harm animal habitat and disturb property owners’ assets; damage to homes, yards, farming equipment, personal vehicles, etc.

**Alternative Action**

The benefits of the alternative action include lowering the secondary risks associated with blasting. Noise and dust issues will be buffered with additional foliage and shrubbery throughout the site, reducing the potential impacts to neighbors’ properties and wildlife.

**No Action Alternative**

Assuming no mining continued within the existing quarry, the risk of explosion would continue to be non-existent.

**Releases or potential releases to the environment affecting public health, such as toxic or hazardous materials**

**Existing Conditions**

Without an active quarry, the chemicals associated with blasting are not a major concern in terms of potential for runoff and public inhalation. There is still a possibility that the blasting agents used in previous mining ventures on the site are present within the soil and ground water, even if only in trace amounts. Further testing would need to be done in order to quantify how much or how little of those toxins are currently present, if at all.

**Proposed Action**

Roughly 90% of the blasting agents used in medium and large sized quarries consist of a combination of ammonium nitrate and fuel oil, or AN-FO (USGS, 2000). AN-FO is used as a low-cost explosive alternative with advantages in safety, economic value, and ease of handling compared to previously used nitroglycerin based explosives. By using a chemical-based blasting agent, there is a risk involved in regards to water supply, public health, and direct exposure to toxins. There is a possibility that with Pacific Northwest weather patterns and the likelihood of frequent, heavy rainfall, those toxins will be distributed throughout the soil, entering the ground water supply, and/or carried to nearby water bodies via storm-water runoff. That potential pollutant load will also create a level risk for protected wetland areas, which are located on either side and through the center of the proposed area. Diesel is another pollutant that could enter groundwater and run off into nearby water bodies. Ammonia is also a potential toxin, although at low levels has the potential to be considered a nutrient for soil factors.
**Alternative Action**

Mining at the proposed site will result in the same impacts as listed under the proposed action. By implementing the alternative action, a percentage of the pollutants and contaminant loads described in the proposal will be limited and/or mitigated. Additional riparian vegetation and alder tree growth near the Nooksack River will help mitigate contaminants from directly entering the water body by slowing and altering their course. Groundwater contaminants may still seep through the soil, but by planting additional trees with intricate root systems, a percentage of those toxins will be kept out of the aquifer.

**No Action Alternative**

If toxic agents are still within the soil, then assessing the need for clean-up would be the next step. The existing conditions would otherwise be unaltered if no action was taken to expand the mine.

**Recreation**

**Existing Conditions**

Eddy’s Mountain public land owned by the Department of Natural Resources, located within the proposed site expansion, is a popular destination for a number of recreational activities. Hiking, climbing, and mountaineering are prevalent outdoor ventures taking place during all seasons. In addition, the South Fork of the Nooksack River is host to recreational fishing, rafting, and kayaking throughout the year.

**Proposed Action**

By cutting into the hillside and introducing the area to mining practices, nearly all elements associated with recreation will be affected. Hiking trails may be shortened, diverted, or eliminated altogether. The combination of noise, dust, and equipment traffic will no doubt alter the overall outdoor experience for any hiker, climber, or mountaineer. Additional sediment loads entering the Nooksack may affect any number of the fish species by displacing habitat, increasing water temperature, and potentially lowering the opportunity for sport fisherman to access certain areas of the river at all. When the mine is in operation during the week, vehicle traffic to Eddy’s mountain may be restricted or detoured.

**Alternative Action**

Certain areas of the site will still have an impact on recreational services throughout the area. The portion of the acreage that is being actively mined will instill all of the impacts listed above, but only in that given area. Increased vehicle traffic may still be an issue during the week, delaying access to trail heads and river sites. By reclaiming the unused portions of the site, issues related to noise, dust, and equipment pollution may be less severe. Trees and plant life will act as a buffer for those elements previously stated, providing hikers, climbers, and mountaineers a more realistic environmental experience—opposed to access of an open quarry. Additional vegetation will help regulate stream bed habitat and help to ensure stronger fish populations.
No Action Alternative

The no action alternative would allow all existing conditions to continue unaltered.

7.2 Land and Shoreline Use

Historical and Cultural Preservation

Existing Conditions

The Nooksack Tribe reservation is located in Deming, ten miles from the proposed site location. The tribe has holdings on more than 2,500 acres of land which includes 65 acres of trust land throughout Whatcom County. Settled in this area for millennia, cultural and historical artifacts associated with tribal history can be found scattered throughout the region, reaching as far north as British Columbia. Burial grounds as well as any archaeological findings associated with the tribe’s extensive history throughout the area are of concern due to the uncertainty of their exact location.

Proposed Action

There is potential for disturbance of unknown elements associated with the archaeological history of the Nooksack Tribe. By digging, bulldozing, and blasting up to 65 feet in depth, the likelihood of uncovering historical artifacts increases. If any piece of earth holds ties to tribal property, all mining operations must cease until the tribe is consulted and decides how to proceed. Preservation of cultural and historical elements is of the highest priority for the tribe and should therefore be considered in the proposal to mine.

Alternative Action

The impacts of the proposed action would all still apply under the alternative. The probability may be lessened if the entire site isn’t used for mining, but the area that remains will still have the potential for uplifting unknown artifacts. No mitigation is purposed.

No Action Alternative

If no action was taken any artifacts related to Nooksack Tribe’s cultural and historical roots would be left unaltered.

Agricultural Crops

Existing Conditions

The proposed 280-acre addition is flanked on three of four sides by active organic farm lands. The farms range in size from five to fifteen acres. Fruits, herbs, vegetables, and flowers are cultivated among all,
and a small number of turkeys are raised on one. Resiliency of those crops is dependent on availability of uncontaminated groundwater.

**Proposed Action**

Dust displacement from mining activities is a concern of the surrounding organic farms land. Toxic chemical releases into water sources and decreased availability in ground water supply may affect the frequency of crop irrigation, air quality, and overall soil longevity. Pollution associated with increased vehicle traffic and equipment operation may also affect the health of the more sensitive seedlings, inhibiting shorter life cycles.

**Alternative Action**

By expanding and operating the mining site while improving the original, inactive acreage, the impacts regarded in the proposed action will still exist but to a lesser degree. Dust and particle debris from mining will be less likely to reach all of the farms with the installment of large buffer zones in and around non-active site land. A portion of the pollutants from blasting chemicals, vehicular traffic, and equipment use will mitigated by vegetation planting; the additional vegetation will create a denser soil structure, trapping pollutants and sediments before they are deposited into the aquifer. The decrease in groundwater availability will be lessened with the presence of more vegetation and forested areas; these elements will reduce runoff, allowing for higher amounts of groundwater filtration, resulting in a higher water table.

**No Action Alternative**

Existing conditions would remain under no action.

**7.3 Transportation**

**Transportation Systems**

**Existing Conditions**

The route to access Bellingham from the Saxon site is via WA-9 and WA-542. The route to access Sedro-Woolley, Burlington, and Mount Vernon is via WA-9, Cook Road, and Freeway Drive. Both routes start from unpaved private roads, then onto Doran Road before reaching WA-9. A short gravel road maintained by the county may be used for additional access to the site.

**Proposed Action**

Figures 2A and 2B show the most likely routes that traffic would use to enter or exit the facility, including employee commuting and material imports and exports via large trucks. These directions were obtained from www.loadedtruck.com's semi and large truck driving directions website.
Rule of thumb says that gravel can be transported about 30 miles while still being economical, which puts Bellingham and Mount Vernon in range (Schaetzl).

**Alternative Action**

Under the alternative action the same impacts would be present as the proposed action. There may also be a possible increase in traffic due to importing of goods for recovery efforts.

**No Action Alternative**

No change in traffic conditions would occur.

**Vehicular Traffic**

**Proposed Action**

Concrete Nor’West employee commuting traffic is not likely to affect local road conditions due to the small number of operating employees. The exported gravel will most likely be transported using open topped dump trucks. The volume is unknown since the extraction rate has not yet been determined. Parking will likely be provided on site.

**Alternative Action**

The alternative action will be the same as the proposed action.

**No Action Alternative**

There will be no change in vehicular traffic patterns.

**Traffic Hazards**

**Proposed Action**

Dump trucks used to export the gravel may release dust into the air (see Air section 6.2). Improperly loaded trucks may leave gravel or debris on the roadway, particularly at the entrance to the worksite on Saxon Road.

**Alternative Action**

Impacts of the alternative action are the same as the proposed action. Possible increase of traffic hazard issues due to the importing of restoration materials.
No Action Alternative

No traffic hazards would be introduced with the no action alternative taken.

7.4 Public Services and Utilities

Fire

Proposed Action

If fire is used to dispose of cleared vegetation then additional fire department support would be temporarily needed. The nearest fire station is the Acme Fire Hall, less than 4 miles (about 7 minutes) away.

Alternative Action

The impacts considered under the alternative action will be the same as the proposed action. There will be a reduced fire hazard post-mining if soil water retention capacity is restored.

No Action Alternative

No change to fire service requirements.

Parks and Recreational Facilities

Proposed Action

The Nooksack River, located to the east, is regularly used for recreational activities. The existence of the mining operation may detract from recreational user(s) experiences if substantial physical barriers are not put in place between the mining site and the riparian area to serve as a visual and audio buffer.

Alternative Action

Improved restoration efforts would reduce all negative effects on recreation. Restored areas would work as buffers for sound, noise, aesthetics, runoff, and wildlife habitat – keeping the area appealing to outdoor enthusiasts.

No Action Alternative

No change in current conditions. The existing mine sites are visually unappealing because the re-vegetation is sparse and dying, and the old mining pit is still clearly visible. Existing un-mined sites are forested with vegetation typical of Pacific Northwest conifer forests and riparian areas.
Maintenance

Proposed Action

Road maintenance may be required prior to dump truck traffic is introduced; local residents have complained of potholes and decaying road conditions in the area. Maintenance would be needed during and after active mining to mitigate for increased traffic from dump trucks and other large vehicles. Increased maintenance will be needed on the county-maintained gravel road if it is used for additional access, as the road is used to access several residences.

Alternative Action

The impacts for maintenance will be the same as proposed action.

No Action Alternative

No increase in maintenance requirements.

Water/Storm Water

Proposed Action

If sediment enters into the Nooksack River through runoff from the site, then total suspended solids levels will likely rise. This will place an additional burden on storm water treatment facilities downriver which are designed to remove TSS from our waterways (such as the one south of WWU). It is unknown what the increase in TSS would be, and therefore it is unknown if these storm water plants would be adversely effected by the increase. See Wildlife section 6.4 for TSS influences on wildlife.

Alternative Action

Sediment levels into the Nooksack River would be reduced from both mining and natural runoff via filtration and settling across the restored landscapes.

No Action Alternative

No change in storm water treatment; it is unknown if the currently exposed existing mines are contributing to Nooksack River sediment loads.
Other Governmental Services or Utilities

It is unknown if Concrete Nor’West plans on using power from an independent source (such as a generator) or from public power lines. Above-ground public power lines run along Doran Road at the entrance to the site.

7.5 Land Use

Existing Conditions

Mining has previously occurred on the site. In 1978 a sand and gravel mining site was opened at the intersection of Bowman and Doran roads. It was permitted by the Washington State Department of Natural resources under the site name Saxon. The permit was for extraction on 20 acres to a depth of 20 feet. In 1997 a revision was made to the permit to allow extraction to a depth of 25 feet. In September 2008, a permit was issued to expand the site to 41 acres with an allowed depth of 65 feet.

In December 2008 the application by Concrete Nor’West was filed in order to expand the MRL designation, changing the commercial forestry designation to MRL and expanding the existing MRL zoning overlay over the commercial forestry zone. In November 2009 the SEPA official issued a Determination of Non-significance.

The proposed site, immediately south of the existing site, is currently zoned according to the Zoning Map and Comprehensive Plan Map as Commercial Forestry Zone. The existing gravel pit site is zoned as Mineral Resource Land (MRL). The proposal is to expand the MRL overlay by an additional 280 acres on the northern slope of Eddy’s Mountain, and change the zoning of Commercial Forestry to MRL. Mining and site use has not occurred for several years. Gravel and rock material from other areas is stored on site. Site reclamation has occurred through the planting of alder trees.

The proposal site is approximately 12 miles southeast of the Bellingham city limits, approximately 18 miles southeast of the Everson and Nooksack city limits and approximately 12.5 miles northeast of Sedro Wooley. Adjacent land uses includes the Skookum Fish Hatchery, Bowman and Doran Road residential communities, 5 to 10 acre farms, some undeveloped parcels and the community of Acme. To the north and west of the site are the farms and rural community; to the east is the Nooksack River and Agricultural Resources zoning.

The Lummi Nation and Nooksack Indian Tribes have stake and interest in the area. Both have provided comments concerning potential water quality and salmon population impacts related to mining in the South Fork Nooksack river sub-Basin. With specific concern for the Skookum fish hatchery located upstream from the site, constructed for the Lummi Nation in 1970.

In addition to concerns about potential environmental impacts related to mining, the Nooksack Indian Tribe and Lummi Nation provided comments noting the possible impacts to cultural resources. The Washington State Department of Archaeology and Historic Preservation also provided a letter stating that there is a high probability of archaeological resources and burials in the Nooksack Valley, and that should future mining occur, they would request a professional archaeological survey.
**Proposed Action**

The Proposed action will result in the rezoning of the site from Commercial Forestry to Mineral Resource Lands. This will allow trees to be cleared, in order to expose the soil and underlying gravel resources. With the removal of soil and digging impacts there may be effects on tribal archaeological sites that may contain valuable objects and cultural information. There are potential water resource and quality impacts, including increased peak flow in nearby streams, flooding, and degradation of aquatic habitat. Increased dissolved and suspended solids in the aquifer and river beds will be the result of erosion. It may have harmful impacts on nearby hatchery and other salmon conservation efforts. Truck traffic may cause increases in traffic, noise, dust, which in turn will affect residential and recreational uses as well as placing stress on roadways, increasing maintenance and repair needs. Residential and Agricultural property values may suffer from aesthetic and recreational degradation.

**Alternative Action**

Areas not actively mined or which have already completed their harvest will undergo reclamation and restoration above the standards of the Mining Reclamation Act. This will include planting of native vegetation. Although some erosion and runoff impacts may have occurred, the reclamation through plant growth will ease the impacts and make for a better habitat than before. With more plant growth and root systems the topsoil and ground may become more stable than previously. Enhanced habitat will allow for the proper conservation of and prosperity for local animal species. Shade from plant growth will aid in maintaining lower temperatures along the Nooksack River and ensuring that local species are able to thrive. Reclamation will also allow for new areas to be inhabited which will aid the entire process forward and allow for larger species domain.

With the reclamation of the site, it is possible to rezone it as forestry or for recreational use in the future. Meeting the standards and beyond the Mining Reclamation Act may result in a more valuable resource area than previous. With enhanced habitat and natural resources property values, water quality and erosion will no longer be impacts. With greater aesthetic qualities recreation may increase, causing a slight increase in traffic but bringing beneficial impacts with it, such as; more economic flow into surrounding businesses, more awareness of local species and their vulnerability and a sense of pride in our rural communities. Plant growth and succession will aid in the reduction of noise and act as a buffer for light and wind.

**No Action Alternative**

No action on this site will result in the area remaining zoned as Commercial Forestry and allow for eventual harvesting. Adjacent properties and land will remain unaltered. Natural erosion and weathering processes may be continuing issues as a result of time but not from the rezoning or mining of the existing site. The Saxon pit site, through Red Alder tree planting, will continue to go through natural succession and eventually create as a natural setting as possible.
Summary of Findings

The Environmental Impact Assessment performed for the proposed Saxon gravel mine analyzed the identified elements of the environment as outlined by the State Environmental Policy Act (SEPA) as well as the Washington Administrative Code (WAC). Through this research and documentation we have found all areas of the Natural Environment, including: Earth, Air, Water, Plants and Wildlife, to be affected by both the Proposed, and Alternative Actions. Elements within the Built Environment that were determined to be affected include: all categories beneath Environmental Health, as well as Land and Shoreline Use; factors within Transportation were found not to be impacted under the circumstances of the Concrete Nor’West proposal. By outlining the probable impacts under the Proposed, Alternative, and No Action Alternatives we were able to construct a Decision Matrix (Section 5.4) to aid in determining the final recommendation.

Recommendation

We are formally recommending the No Action Alternative be taken in response to the proposal presented by Concrete Nor’West of Burlington, Washington. Our conclusion is supported by the evaluation of the impacts measured in the Decision Matrix (Section 5.4) and by the assessment of the individual elements that have been made throughout the body of this report. The environmental impacts that will result from both the Proposed and Alternative Actions are too substantial among all categories—Natural and Built Environments—to agree with either option. The No Action Alternative will allow all existing conditions to remain, as well as eliminate any option for future environmental damage throughout the site and surrounding areas.
9.0: Appendix

Figure 1A – Development parcels and geologic-sampling locations with topographical isolines every 10 ft.

Figure 1B – Roads, hydrology, and development around mining area
Figure 1C.
Proposed Expansion South Fork Nooksack Gravel Mine
Surrounding Habitat Types

Legend
- County and Forestry Roads
- Rivers, Streams, Lakes
- Low Intensity Developed
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Scrub/Shrub
- Wetlands
- Unconsolidated Shore
- Bare Land
- Palustrine Aquatic Bed
- Estuarine Aquatic Bed
Proposed Expansion: South Fork Nooksack Gravel Mine

Figure 2A – Road access for large vehicles Mount Vernon

Figure 2B – Road access for large vehicles Bellingham
Figure 4A - Geologic Profile A-A'

Figure 4B - Geologic Profile B-B'
Figure 4C - Geologic Profile C-C'

Figure 4D - Geologic Profile D-D'
9.1: Appendix

6.16.710 - Designation, mapping and classification – Habitat conservation areas.

A. Habitat conservation areas are those areas identified as being of critical importance to the maintenance of certain fish, wildlife, and/or plant species. These areas are typically identified either by known point locations of specific species (such as a nest or den) or by habitat areas or both. All areas within the county meeting these criteria are hereby designated critical areas and are subject to the provisions of this article (see also Appendix 9.1.1 of this chapter).

B. The approximate location and extent of identified fish and wildlife habitat areas are shown on the county’s critical area maps. These maps are to be used as a guide and do not provide a definitive critical area determination. The county shall update the maps as new fish and wildlife habitat areas are identified.

C. For purposes of this chapter, habitat conservation areas shall include all of the following:

1. Streams. Streams shall be designated according to the following criteria:
   a. Shoreline streams are those streams identified and regulated as shorelines of the state as defined by WAC 173-18-410 and designated in the Whatcom County Shoreline Master Program (WCC Title 23).

2. Areas with which federally and/or state-listed species have a primary association.
3. State priority habitats and areas associated with state priority species.
10.0 References


*ESRI WWU Spatial Analysis Lab Database.* NOAA, USGS, WWU, ESRI, 1 Mar. 2012


