

Spring 2011

Barlean's Organic Oils: rezone & expansion: environmental impact assessment

Katarina Bunge
Western Washington University

Nikki Dizon
Western Washington University

Bennett Harbaugh
Western Washington University

Allyson Hayes
Western Washington University

Kristina Kraft
Western Washington University

See next page for additional authors

Follow this and additional works at: https://cedar.wwu.edu/huxley_stupubs

 Part of the [Environmental Studies Commons](#)

Recommended Citation

Bunge, Katarina; Dizon, Nikki; Harbaugh, Bennett; Hayes, Allyson; Kraft, Kristina; and Wheeler, Jarrett, "Barlean's Organic Oils: rezone & expansion: environmental impact assessment" (2011). *Huxley College Graduate and Undergraduate Publications*. 11.
https://cedar.wwu.edu/huxley_stupubs/11

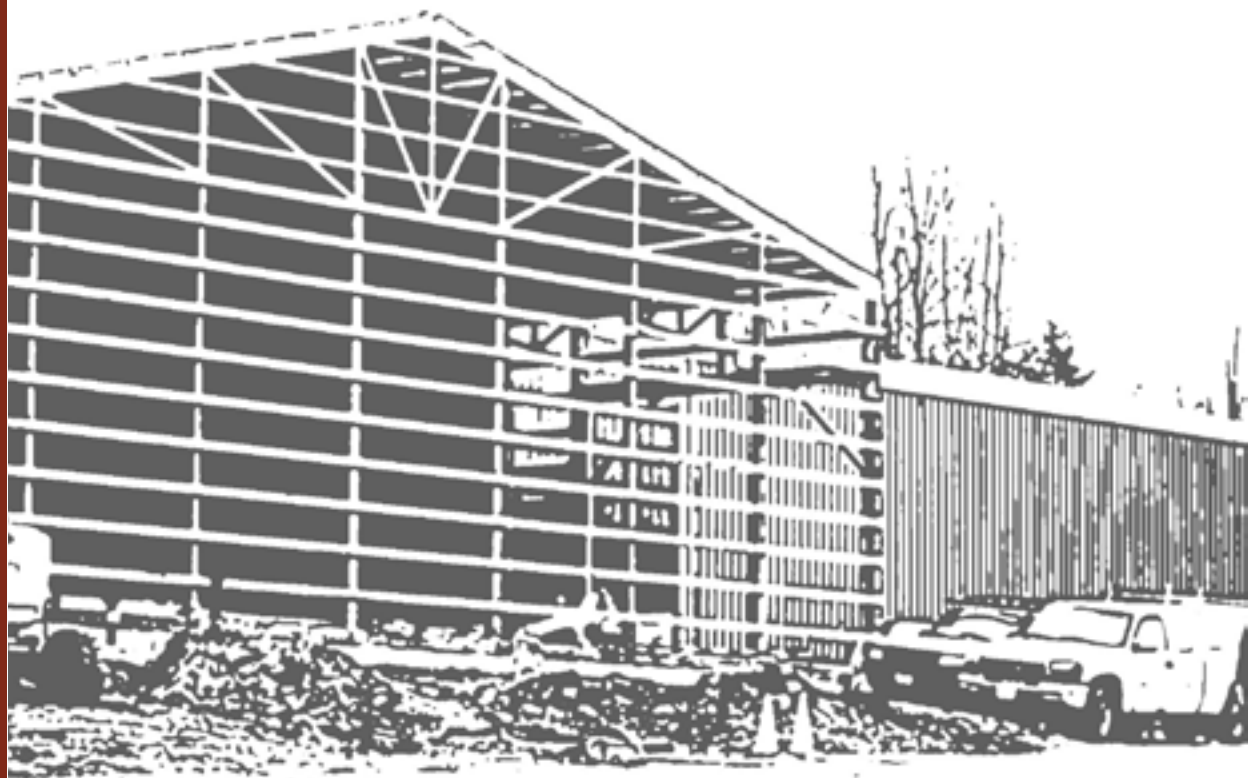
This Environmental Impact Assessment is brought to you for free and open access by the Huxley College of the Environment at Western CEDAR. It has been accepted for inclusion in Huxley College Graduate and Undergraduate Publications by an authorized administrator of Western CEDAR. For more information, please contact westerncedar@wwu.edu.

Author

Katarina Bunge, Nikki Dizon, Bennett Harbaugh, Allyson Hayes, Kristina Kraft, and Jarrett Wheeler

BARLEAN'S ORGANIC OILS REZONE & EXPANSION

Environmental Impact Assessment



Western Washington University
Huxley College of the Environment
Spring 2011

Environmental Impact Assessment
Huxley College of the Environment

I/we grant to Western Washington University the non-exclusive royalty-free right to archive, reproduce, distribute, and display this Environmental Impact Assessment document in any and all forms, including electronic format, via any digital library mechanisms maintained by WWU.

I/we represent and warrant this is original work, and does not infringe or violate any rights of others. I/we warrant that I/we have obtained written permissions from the owner of any third party copyrighted material included in this document.

I/we acknowledge that I/we retain ownership rights to the copyright of this work, including but not limited to the right to use all or part of this work in future works, such as articles or books. Library users are granted permission for individual, research and non-commercial reproduction of this work for educational purposes only. Any further digital posting of this document requires specific permission from the author(s).

Any copying or publication of this document for commercial purposes, or for financial gain, is not allowed without my/our written permission.

Signature Katarina Bunge
Katarina Bunge

Signature Nikki Dizon
Nikki Dizon

Signature Bennett Harbaugh
Bennett Harbaugh

Signature Allyson Hayes
Allyson Hayes

Signature Kristina Kraft
Kristina Kraft

Signature Jarrett Wheeler
Jarrett Wheeler

Date June 3, 2011

WESTERN WASHINGTON UNIVERSITY

BARLEAN'S ORGANIC OILS

REZONE & EXPANSION

ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Studies 436

Professor Jean Melious

Katarina Bunge

Nikki Dizon

Bennett Harbaugh

Allyson Hayes

Kristina Kraft

Jarrett Wheeler

This document represents a class project carried out by students of Western Washington University, Huxley College of the Environment. It has not been undertaken at the request of any people representing local governments or private individuals, nor does it necessarily represent the opinion or position of individuals from government or the private sector.

HUXLEY COLLEGE OF THE ENVIRONMENT

Spring 2011

TABLE OF CONTENTS

Title.....	4
Description of Project	4
Legal Description of Location	4
Prosper	5
Lead Agency	5
Permits	5
Authorizing Ordinances and Policy	5
Contributors	5
Distribution List	5
Acknowledgements.....	6
Issue Date	6
Public Presentation.....	6
EXECUTIVE SUMMARY	7
GLOSSARY	9
ALTERNATIVES.....	11
PROPOSED ACTION	11
PREFERRED ALTERNATIVE ACTION	11
NO PROJECT ACTION	12
IMPACTS.....	18
LAND USE	18
Proposed Action	18
Preferred Alternative	18
No Project	18
WATER.....	18
SURFACE	18
Proposed Action	18
Preferred Alternative	19
No Project	19
GROUND	19
Proposed Action	19
Preferred Alternative	19
No Project Action	20
WATER RUNOFF	20
Proposed Action	20
Preferred Alternative	20
No Project Action	20
AIR.....	20
GREENHOUSE GASES (GHG).....	21
PLANTS AND ANIMALS	23
Proposed Action	23
Preferred Alternative	24
No Project Action	24
TRANSPORTATION	24

Proposed Action	24
Preferred Alternative	24
No Project Action	25
ENERGY AND NATURAL RESOURCES	25
Proposed Action	25
Preferred Alternative	25
No Project Action	25
AESTHETICS	25
Proposed Action	25
Preferred Alternative	25
No Project Action	25
LIGHT AND GLARE	26
Proposed Action	26
Preferred Alternative	26
No Project Action	26
NOISE.....	26
Proposed Action	26
HISTORIC AND CULTURAL PRESERVATION.....	27
Proposed Action	27
Preferred Alternative	28
No Project Action	28
ENVIRONMENTAL HEALTH	28
Proposed Action	28
Preferred Alternative	28
No Project Action	29
EARTH	29
Proposed Action	29
Preferred Alternative	29
No Project Action	29
DECISION MATRIX.....	31
Weighting Explanation.....	32
Ranking and Relative Comparison of Plans.....	33
REFERENCES (American Political Science Association).....	33
GHG Appendix	a
Definition of Building Types	a
Embodied Emissions.....	a
Background Information on Embodied Emissions	b
<i>Buildings</i>	b
<i>Pavement</i>	c
Sources:	c
Energy Emissions.....	d
Background Information on Energy Emissions	e
Vehicle related GHG emissions.....	g
Background Information on Transportation Emissions.....	h

FACT SHEET

Title

Barlean's Organic Oils Rezone and Expansion

Description of Project

In the spring of 2010 Barlean's Organic Oils, LLC. applied to Whatcom County to rezone 35 acres on their 40 acre property from rural-5 (R5A) to Light Impact Industrial (LII). The purpose the rezone is to expand their processing facilities and warehousing storage capacity.

Barlean's is a fish oil and flax seed oil processing plant located in Whatcom County, WA. Specifically, Barlean's Organic Oils, LLC. headquarters and processing facilities are located on the southwest 10-acres of their 40-acre square property, northeast of the Slater Road and Lake Terrell Road junction. Barlean's is adjacent to ConocoPhillips' crude oil refinery to the west, privately owned rural county residents on the north and east, and the Lummi Nation Reservation to the south.

In February of 2011, Whatcom County approved the rezone of 35 acres of the Barlean's property. Before the rezone, Barlean's processing facilities were operating under conditional use permits (CUP1993-0036, CUP1997-00002 and CUP2000-00024) and were restricted to the southwest 10 acres. The rezone changed 35 acres of Barlean's property from a R5A zone to a LII zoning designation. The zoning has been approved by the county but the buildings that Barlean's intends to construct on the rezoned land have yet to be permitted.

There are four 20,000 square foot buildings Barlean's plans to add outside the originally-developed 10-acre area as well as two additional pre-approved 20,000 and 5,000 square foot facilities on the existing 10 acres. These buildings will house a protein plant, dry boat storage, seed storage, packing plant, material warehousing and office space. In addition, Barlean's plans to build a 27,000 square foot, four-foot deep drainage pond on the southeast corner of the property to account for impervious surface water runoff. The drainage pond will be located within the new LII zone between a category IV wetland area and the proposed material warehousing building (Figure 4). An employee nature walk and a 25-foot wide quick growing native plant buffer is planned to the north and east sides of the rezone area to mitigate encroaching expansion toward the neighbors (Figure 4) In all, the new operational LII zone will include 35 acres, leaving a five acre triangular plot on the northeast corner of the property that will remain a R5A zone for future residential use (Figure 2).

Legal Description of Location

Ptn. SW $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 34, Twp. 39 N., R.1 E. of W.M.

Except the tract of land in the southwest quarter of the southwest quarter of section 34, T 39 N, E, R1 E, W. M., Whatcom County, Washington, Described in the following:

Beginning 660 feet west of the northeast corner of said subdivision; thence east to the northeast corner of said subdivision; thence south 660 feet along the east line of said subdivision to a point; thence in a northwesterly direction to the point of beginning, less roads.

Prosper

Barlean's Land Company LLC.
4836 Lake Terrell Rd.
Ferndale WA, 98248

Lead Agency

Whatcom County
Planning & Development Services
5280 Northwest Drive
Bellingham, WA 98226-9097

Permits

- Site Specific Rezone Development Agreement PLN2010-00020 & PLN2010-00023.
- Development Agreement: pg. 1; NOW, THEREFORE, The parties covenant and agree, as follows: 6 (3)(a) Permitted Uses. Permitted uses authorized pursuant to WCC 20.66.051 and .059 *et. sec.* are allowed, including "primary processing" of fish products. All other permitted uses are prohibited.

Authorizing Ordinances and Policy

- SEPA Notice of Determination of Non-Significance (DNS), dated November 2, 2010 with checklist attached
- Whatcom County Comprehensive Land Use Plan
- Whatcom County Code Chapter 15, Building Code
- State Environmental Policy Act (SEPA). Washington Administrative Code Chapter 197-11, Whatcom County Environmental Policy Administration Chapter 16.08
- Whatcom County Code Chapter 16.16, Critical Areas
- Whatcom County Code Title 20, Official Whatcom County Zoning Ordinance
- Whatcom County Code Title 24, Health Regulations
- Revised Code of Washington 36.70B.170 through .210 and Chapter 58.17
- Whatcom County Code Chapter 12.08, Development Standards
- Whatcom County Code Title 21, Subdivision Regulation

Contributors

Katarina Bunge, Nikki Dizon, Bennett Harbaugh, Allyson Hayes, Kristina Kraft, and Jarrett Wheeler

Distribution List

- Jean Melious, Associate Professor of Environmental Studies; Huxley College of the Environment, Western Washington University
- Huxley College Collection (Electronic File) at http://content.wwu.edu/cdm4/index_hcc.php?CISOROOT=/hcc
- Wilson Library
- Contributors (see above for list of names)

Acknowledgements

- *Jean Melious*, Associate Professor, Department of Environmental Studies; Huxley College of the Environment, Western Washington University
- *Amy Keenan*, AICP, Senior Planner, Whatcom County Planning & Development Services
- *Dave Barlean*, Owner of Barlean's Organic Oils
- *Audrey Johnson*; Executive Assistant to Vice President of Operations, Barlean's Organic Oils

Issue Date

June 1, 2011

Public Presentation

Academic Instructional Center West Room 302; Western Washington University, E. College Way, Bellingham, WA 98225. Date: June 1st, 2011 at 11:30am

EXECUTIVE SUMMARY

The Barlean's Organic Oils fish and flaxseed processing company, based in Ferndale, Washington, has applied for a site-specific rezone of 35 acres of their 40 acre property, from Rural (R5A) to Light Impact Industrial (LII). The business, located at the intersection of Lake Terrell Road and Slater Road, was founded in 1972 for fish processing. In 1993, Barlean's received a conditional use permit to begin flaxseed oil production, on top of their existing conditional use permits for fish processing. Currently, 10 acres located in the southwest corner of the property have been developed for industrial fish and flax oil processing. The Barlean's property rezone is requested in order to expand flaxseed oil production specifically. Twenty new jobs are expected to be created as an effect of the rezone.

Thirty-five acres of the Barlean's property will be rezoned from R5A zoning to LII, with an additional development agreement between Barlean's Land Company, LLC, and Whatcom County. The development agreement outlines a rough proposal for expansion. The proposal includes the construction of four 20,000 square-foot pole buildings, construction of paved and gravel road sections and 88 additional parking spots on the undeveloped 25 acres. The four proposed buildings will be assigned the following uses:

- Dry boat storage
- Seed storage
- Future materials warehouse
- Packaging plant

As mitigation for the increase in impervious surfaces proposed in the Barlean's expansion, a larger drainage pond will be constructed in the southeastern corner of the property. A 25-foot wide native vegetation border will be installed along the north and east sides of the property in order to mitigate aesthetic impacts.

On November 2, 2010, a Determination of Nonsignificance (DNS) was made regarding Barlean's Land Company, LLC's application to rezone through the SEPA review process. On February 22, 2011, the Whatcom County Council approved the Barlean's property rezone to LII and the development agreement for future expansion.

There is controversy regarding the Whatcom County Council's decision to approve a site-specific rezone of a private business from R5A to LII, particularly when the LAMIRD zone designation appears to describe the site's function more accurately than an LII zoning. Furthermore, allowing the LII zoning is considered a gateway to industrial sprawl in a traditionally rural area.

This analysis aims to explore the Whatcom County Council DNS and subsequent approval of the Barlean's Land Company, LLC rezone. A preferred alternative to the Barlean's expansion plan involves removing the 20,000 foot dry boat storage building from the expansion. No area for dry boat storage would be provided in the alternative plan. Paved road expansion must only be allowed in areas of heavy truck use – all other parking lot expansion and lower-use roads should be pervious surfaces. The vegetation buffer is suggested to increase from 25 feet in width to 50 feet in width. The preferred alternative hopes to restore portions of the pasture land in the undeveloped 25 acres to native vegetation, as well as reduce the overall area of impermeable surfaces on site.

LIST OF FIGURES & TABLES

Figure 1 Location of Barlean's Organic Oils 40-acre parcel. Southwest 10 acres are currently developed.	13
Figure 2 Zoning in and around Barlean's 40-acre property line. Top image shows current zoning, bottom image shows proposed zoning.	14
Figure 3 Current status of Barlean's 40-acre parcel, located in Ferndale, Washington.	15
Figure 4 Proposed plans for Barlean's 40-acre parcel, located in Ferndale, Washington.	16
Figure 5 Preferred alternative plans for Barlean's 40-acre parcel, located in Ferndale, Washington.	17
Figure 6 Total GHG Emissions (Metric Tons of CO ₂ Equivalent).	23
Table 1 Decision Matrix.	30

GLOSSARY

Category IV Wetland: Category 4 wetlands are non-riparian wetlands that have the lowest levels of functioning and are often heavily disturbed. These wetlands may provide some significant habitat value, and should be protected to some degree.

Class 'A' Water System: Barlean's is currently served by a Class A water treatment system which is based on a 10 gallon per minute drilled well.

CUP: A Conditional Use Permit, is a regulatory permit granted by a municipality to authorize a development type or land use on a specific lot that would not otherwise have been permitted by the underlying zoning code. In many instances the permit is granted only upon the fulfillment of certain conditions.

Determination of Nonsignificance (DNS): A DNS or "determination of nonsignificance" documents the responsible official's decision that a proposal is not likely to have significant adverse environmental impacts (DOE 2011).

Greenhouse Gas (GHG): A greenhouse gas is a gas in the atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. Although carbon dioxide and other GHGs are naturally occurring in the atmosphere, an overabundance is thought to negatively contribute to climate change.

High Impact Industrial (HII): The High Impact Industrial zoning classification is land area for large-scale heavy industry that has a high impact on the surrounding neighborhood and environment. The purpose of HII is to reserve appropriate areas to attract heavy industrial manufacturing uses and provide employment opportunities while minimizing land use conflicts and off-site impacts.

Impervious Surface: Impervious surface refers to anything that prevents water from soaking into the ground and lead to runoff. Common examples include roofs, driveways, sidewalks, streets, and parking lots.

LAMIRD: LAMIRD is a "Limited areas of more intensive rural development" (LAMIRDs). The Whatcom County GMA allows counties to designate LAMIRDs to "minimize and contain" areas where more intensive uses and densities already existed when the GMA took effect in 1990.

Light Impact Industrial (LII): The purpose of the Light Impact Industrial zoning classification is to provide for the planned development of large land areas, in appropriate locations, primarily for industrial and subordinate uses which provide support services to the district. Light industrial uses are primarily related to services, and distribution, manufacture and assembly of finished products that have a relatively light impact on adjacent uses and districts.

LNTHPO: Lummi Nation Tribal Historic Preservation Office

R5A or Rural 5: Whatcom County zoning classification of 1 dwelling unit per 5 acres. According to Whatcom County's Comprehensive Plan, the rural zoning designation is designed to provide

land with less traffic, noise and congestion than in urban areas with low-density population, open space, privacy, largely forestry and small-scale, agriculture oriented business.

Site-Specific Rezone: Is a proposed change or revision to the official county zoning map affecting a limited number of acres and must be composed of a single parcel or contiguous parcels that are under one or a limited number of ownerships and are requested to allow a specific project not allowed under the current zoning designation.

State Environmental Policy Act (SEPA): A state policy that requires state and local agencies to consider the likely environmental consequences of a proposal before approving or denying the proposal (DOE 2011).

ALTERNATIVES

PROPOSED ACTION

Barlean's Organic Oils is proposing a site specific rezone from R5A to LII on 35 acres of their 40-acre parcel located at the northeastern corner of Lake Terrell and Slater Roads in Ferndale, Washington (Figure 1). Currently the southwest 10-acre corner of their land is developed and used for fish and flax oil processing via conditional use permits (CUP1993-0036, CUP1997-00002 and CUP2000-00024). The proposed rezone will add 35 acres of LII land, 10 of which are developed, allowing for 25 acres of industrial expansion. A 5-acre parcel in the northeastern corner the property will be left as a Rural (5) zone (Figure 2). In addition to the rezone, a plan for expansion is proposed. This expansion (Figures 3 & 4) calls for an additional 80,000 square feet of construction in the form of four new buildings for industrial use; dry boat storage, seed storage, packaging and material warehousing. In addition, parking, paved driveways and loading docks will be constructed. An enlarged drainage pond will also be added to the southwestern corner of the property to account for the increase in impervious surface runoff.

PREFERRED ALTERNATIVE ACTION

The alternative action would allow the Site Specific Rezone from R5A to Light Impact Industrial (LII) on the 35-acre parcel, provided modifications to the site development. Primarily the alternative seeks to reduce the project size and development in order to limit environmental degradation while still maintaining the proposed action's objective of expansion.

The 20,000 square foot dry boat storage building will be removed from the proposed development, as there is an already existing offsite location. The additional seed storage building would then take the location of the former boat storage building; this would allow more efficient access to Lake Terrell Road and effectively remove a large portion of the proposed internal roadways and 20 of the intended parking spaces (Figure 5). All remaining internal roads and parking areas that were considered as either paved or gravel will be designated gravel with the exception of the northwest entrance leading to the seed storage building, and in other areas of heavy truck use. This action will decrease the total percentage of impervious surfaces and lessen the associated environmental impacts of storm water runoff. Due to these effects the proposed drainage pond located in southeast corner of the property will still be constructed but to a lesser degree.

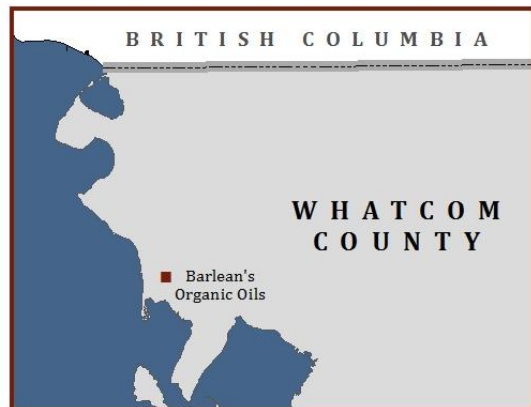
To address the issue of noise impact and to retain to the extent possible the rural character of the area the vegetative buffer required in the Development Agreement will be increased from 25 feet to 50 feet, extending the distance between business operations and the adjoining rural properties and country roads. Additionally the alternative hopes to restore native vegetation on the undeveloped 25 acres of pastureland within the site. This will not be a condition required for approval, but rather a recommended voluntary mitigation measure the business will be encouraged to take.

All other criteria and requirements of the existing Development Agreement will still be necessary conditions of approval for the Site Specific Rezone. The preferred alternative will set additional development limits to reduce and mitigate environmental impacts of the expansion.

NO PROJECT ACTION

Without the site specific rezone of Barlean's from Rural 5 (R5A) to Light Impact Industrial (LII), Barlean's would be unable to expand their flax and fish oil processing and manufacturing business on their current site. Their proposed expansion of 80,000 square feet of new construction could not be completed. Current operations would continue on the developed 10-acre southwest corner parcel of land under the aforementioned conditional use permits. The current level of approximately 100 employees would be maintained, but no new jobs would be created.

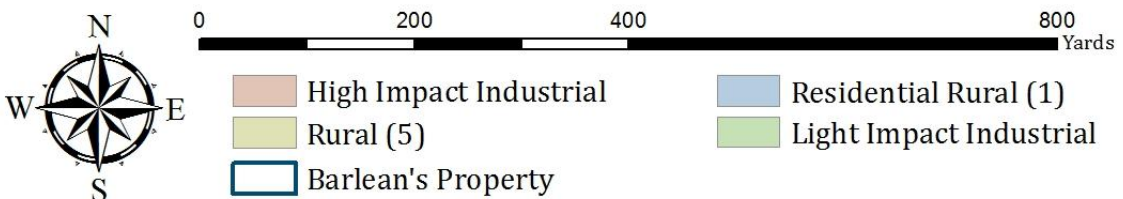
BARLEAN'S ORGANIC OILS



Sources: ESRI, Western Washington University, Whatcom County Coordinate System: NAD 1927 UTM Zone 10N Cartography: Ally Hayes

Figure 1 Location of Barlean's Organic Oils 40-acre parcel. Southwest 10 acres are currently developed.

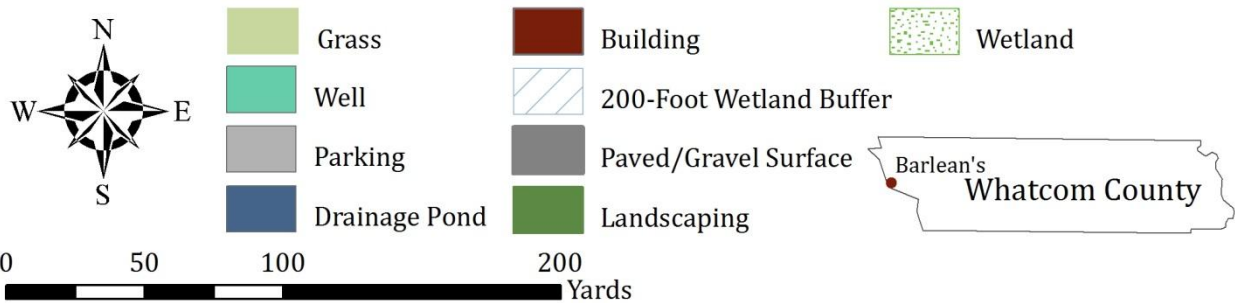
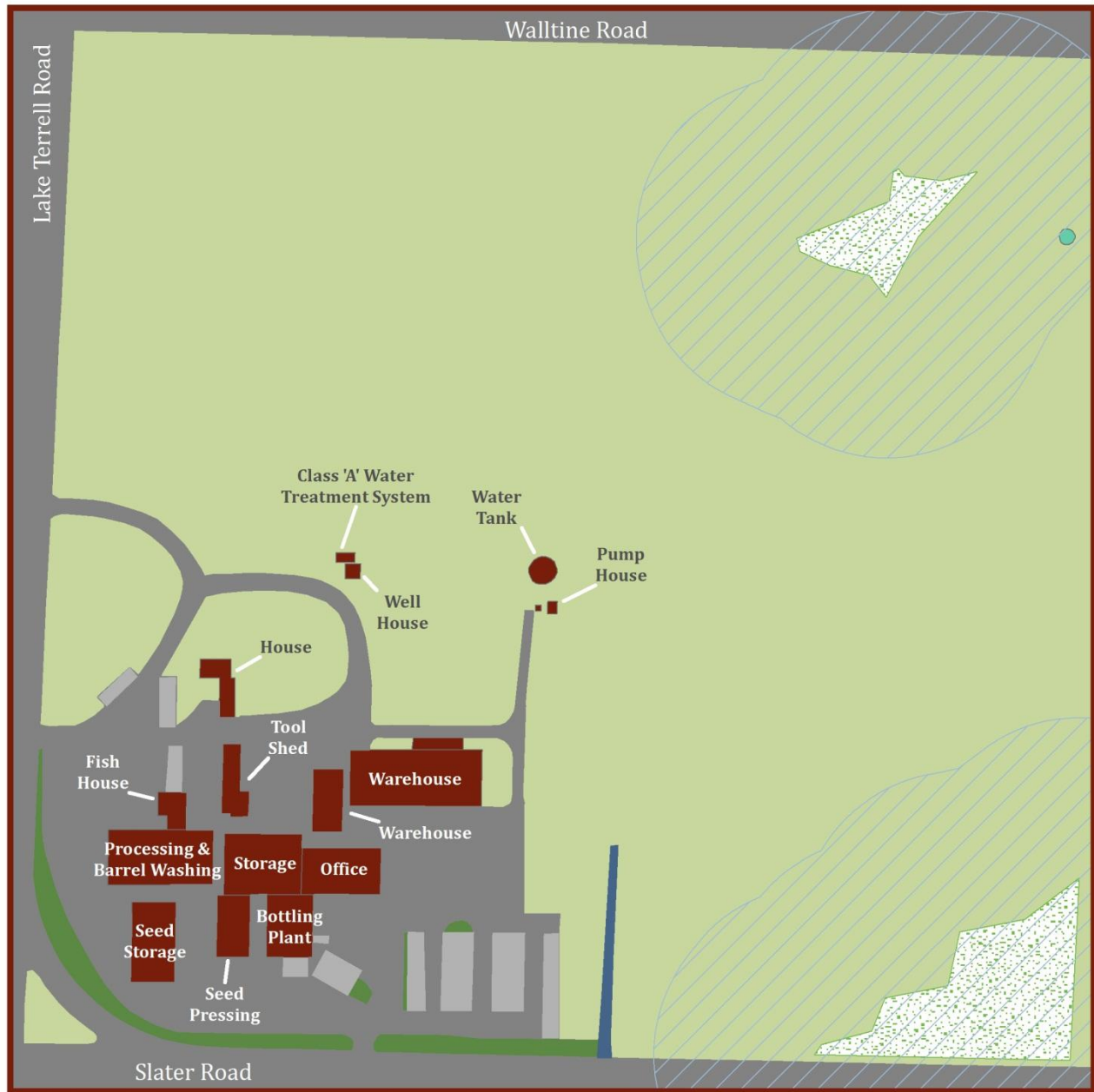
BARLEAN'S REZONE



Sources: ESRI, Western Washington University, Whatcom County Coordinate System: NAD 1927 UTM Zone 10N Cartography: Ally Hayes

Figure 2 Zoning in and around Barlean's 40-acre property line. Top image shows current zoning, bottom image shows proposed zoning.

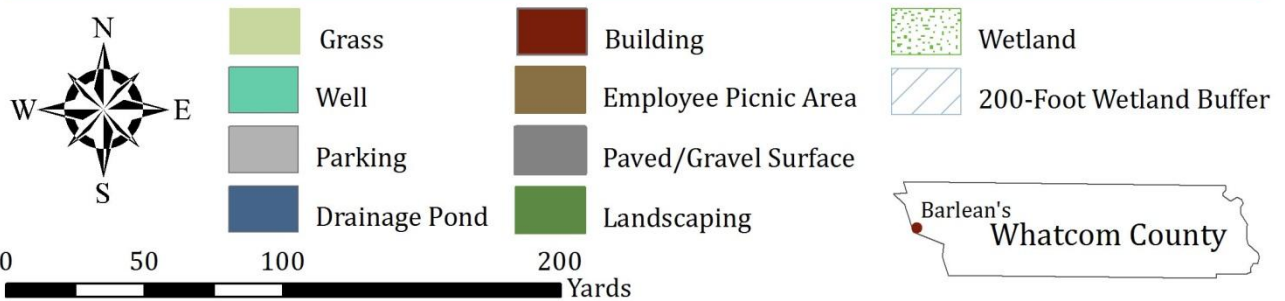
CURRENT



Sources: ESRI, Pioneer Post Frame Inc., WWU Coordinate System: NAD 1983 State Plane WA North Cartography: Ally Hayes, 2011

Figure 3 Current status of Barlean's 40-acre parcel, located in Ferndale, Washington.

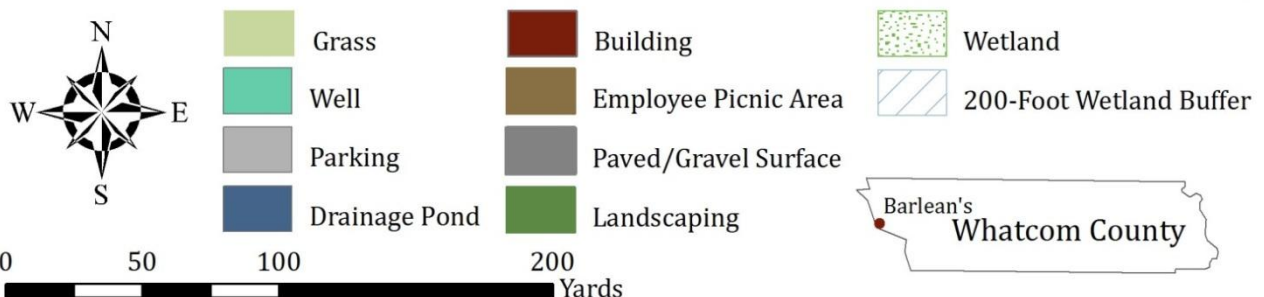
PROPOSAL



Sources: ESRI, Pioneer Post Frame Inc., WWU Coordinate System: NAD 1983 State Plane WA North Cartography: Ally Hayes, 2011

Figure 4 Proposed plans for Barlean's 40-acre parcel, located in Ferndale, Washington.

PREFERRED ALTERNATIVE



Sources: ESRI, Pioneer Post Frame Inc., WWU Coordinate System: NAD 1983 State Plane WA North Cartography: Ally Hayes, 2011

Figure 5 Preferred alternative plans for Barlean's 40-acre parcel, located in Ferndale, Washington.

IMPACTS

LAND USE

Proposed Action

Barlean's seeks a site specific rezone and approval of a development agreement to expand their flax and fish oil business. The development agreement would expand Barlean's facilities by 80,000 square feet and create 20 additional jobs, with around 120 employees in total. The current zoning classification of the site is R5A and the rezone would change 35-acres of the 40-acre parcel to LII. In the past, Barlean's has operated under several conditional use permits (CUP1993-0036, CUP1997-00002 and CUP2000-00024) to permit flaxseed production. At the time the 1993 CUP was granted, the flaxseed oil processing use was a conditional use allowed in R5A zones. The processing of agricultural products grown outside of Whatcom County is no longer an accepted use under a rural zone CUP so in order to expand their existing flaxseed oil operations, Barlean's requested a LII rezone. The rezone is compliant with the Growth Management Act, as well as the Rural Element of the Whatcom County Comprehensive Plan which includes areas set aside for low impact manufacturing facilities.

Preferred Alternative

The preferred alternative would allow the rezone to occur, but would lessen the degree of expansion by eliminating the construction of the boat storage facility. It would also limit industrial uses to those currently permitted through their aforementioned CUPs. All jobs would be maintained and 20 additional jobs would be created through the expansion of facilities.

No Project

Without the rezone, Barlean's would be unable to expand their business to the desired degree. Barlean's could not build a bottling facility but could possibly build additional barns for storage. No growth related to the flax-oil processing could occur because the flax is not grown within Whatcom County. There is the possibility Barlean's could grow their own flax within the county, allowing them to expand flax-oil processing with additional CUPs. Overall, if no project occurred, the current amount of employees would be maintained, but no new jobs would be created.

WATER SURFACE

Proposed Action

Two wetland areas (category IV wetlands) exist on the site with one located in the northeastern quarter of the 40 acre parcel and the other located in the southeastern quarter (Figure 3). A large drainage pond is proposed to be constructed well within 200 feet of the southeastern wetland. In addition, two of the proposed structures cross slightly into the 200-foot wetland buffer. No construction will occur directly within the extent of the wetlands (Figure 4). Additional wetlands exist to the north and west of the parcel but construction will not occur within 200 feet of these wetlands. The effects of this construction adjacent to these wetlands are minimally significant because of their category IV rating, suggesting they have the lowest levels of functioning, with little habitat value. No surface water withdrawals or diversions will be required for the proposed action. The proposal does not occur within a 100-year floodplain. No discharges of waste materials to surface water will occur.

Preferred Alternative

The recommended preferred alternative is to reduce the size of the proposed drainage pond located in the southeastern corner of the 40 acres. The mitigation is possible due to the decrease in impervious surface water runoff. Although the drainage pond will be decreased in size, construction will still occur within 200 feet of the southeastern wetland, but to a lesser degree. The material warehousing building will still be marginally within the 200-foot buffer of the southwestern wetland, but the elimination of the boat storage building and the subsequent repositioning of the seed storage building will result in no construction within the 200-foot buffer of the northeastern wetland, (Figure 5) thus lessening the impacts on wetland areas.

No Project

Surface waters will not be additionally affected because no construction will occur outside of the 10 acres under the current CUPs.

GROUND

Proposed Action

Ground water is currently withdrawn from an exempt well, which is part of an existing class 'A' water system. The drilled well can pump 10 gallons per minute for up to 5,000 gallons per day. This system is sufficient for the current operations, but will need to be expanded to accommodate for the proposed construction. Barlean's was approved by the Whatcom County Public Utility District #1, for a supply of industrial water in order to preserve water quality and quantity on neighboring properties. This will increase the water supply up to 250,000 gallons per day. This is a substantial increase in volume, but will not negatively affect the water supply of surrounding properties.

Sewage is disposed via two onsite septic drain field systems. Each system is designed to handle waste from 100 people. The 200-person capacity is adequate for the current 100 employees as well as the proposed expansion that will increase employment to 120 people.

Oil residue from the washing of flax barrels is contained in an underground vault and currently trucked to a nearby manure lagoon located at Pleasant Valley Dairy in Ferndale, once a week. With increased production, the amount of waste may be increased slightly, but not significantly.

Preferred Alternative

The current water system will need to be expanded to accommodate for the preferred alternative action. This will increase the water supply from 5,000 gallons per day, but because less expansion will occur, water usage will not increase to the proposed 250,000 gallons per day.

The alternative action will still allow for an increase in employment to about 120 people, thus, the current 200-person capacity is adequate for this increase in employment.

Oil residue from the washing of flax barrels is contained in an underground vault and currently trucked to a nearby manure lagoon. With increased production, the amount of waste will likely be increased, but to a lesser degree than proposed.

No Project Action

Ground water is currently withdrawn from an exempt well which is part of an existing class 'A' water system. This drilled well can pump 10 gallons per minute for up to 5,000 gallons per day. This system is sufficient for the current operations and if no project occurs, water withdrawals will not need to be increased.

The 200-person capacity is adequate for the current 100 employees and with no project action; the current employment will not increase.

WATER RUNOFF

Proposed Action

Runoff from parking lots, loading areas, buildings, driveways, and other impervious surfaces is collected by a storm water system. All present runoff is routed to a small drainage pond located in the southeastern portion of the currently developed 10- acre parcel. With the proposed expansion, this pond will be relocated and enlarged in the southeast corner of the 40 acre parcel to accommodate for the 26.8% proposed increase in impervious surface runoff.

Preferred Alternative

Runoff from parking lots, loading areas, buildings, driveways, and other impervious surfaces is collected by a storm water system. All present runoff is routed to a drainage pond located in the southeastern portion of the currently developed 10- acre parcel. With the proposed expansion, this pond will be enlarged to a lesser degree than the proposed action and relocated to the southeast corner of the 40 acre parcel to accommodate for the 5.3% increase in impervious surface runoff, significantly lower than proposed.

No Project Action

Runoff from parking lots, loading areas, buildings, driveways, and other impervious surfaces is collected by a storm water system. All runoff is routed to a drainage pond located in the southeastern portion of the currently developed 10- acre parcel. With no project action, there will be no need for expansion and relocation of the current drainage pond.

AIR

The State Environmental Policy Act (SEPA) greenhouse gas (GHG) emissions worksheet estimates all GHG emissions released over the lifespan of the given project. The calculated total emissions are represented in Metric Tons of CO₂ Equivalent (MTCO₂e). "Equivalent" is used because CO₂ is among many GHGs released and we know the relative strength of CO₂ as an acting GHG compared to other GHGs. Thus the total emissions can be estimated as if CO₂ were the only GHG released.

Proposed Action

The proposed action should produce emission levels expected of a project its size in both the construction phase and lifespan of the buildings constructed. The primary emission would be CO₂ but might also include methane, nitrous oxide, and water vapor. The estimated total emissions from the proposed action are 113,358 MTCO₂e. The sum total is 199,697 MTCO₂e when combined with the emissions from the existing facilities. This is a 130% increase in emissions.

Preferred Alternative

The alternative action would mitigate emission levels by using gravel instead of asphalt or concrete and also by not constructing the dry boat storage building. The estimated total emissions from the alternative action are 87,788 MTCO_{2e}. The sum total is 174,127 MTCO_{2e} when combined with the emissions from the existing facilities. This is a 102% increase in emissions.

No Project Action

The primary GHG released at the existing Barlean's facility is carbon dioxide (CO₂) through energy consumption, transportation, and the manufacturing process. Other GHGs, methane and nitrous oxide, might also be present from the manufacturing process but are not likely to be released at higher than trace levels. Hydrofluorocarbons (HFCs) may be released from the refrigerants used in Barlean's fish sale operation but this operation is relatively small so the corresponding HFC emission levels should also be small. These emissions do not pose any immediate health risks for the surrounding community and would not be considered significant.

The nearby oil refinery and aluminum smelter produce odors but any odors originating from the Barlean's site are minor. The estimated total emissions over the lifespan of the existing facilities are 86,339 MTCO_{2e}. It should be noted that the existing buildings were not all constructed at the same time so they are at different stages of their expected lifespan. A description of the calculated emissions and the importance of GHGs are presented on the next page in the GHG Report.

GREENHOUSE GASES (GHG)

At the center of the debate around global climate change are two undeniable facts. The first is that certain gases in the atmosphere absorb and reradiate infrared radiation but are transparent to ultraviolet light. This allows energy from the sun to be captured by our atmosphere, which has a warming effect on our planet. These gases are known as greenhouse gases (GHG) because of this warming effect most commonly known of them is carbon dioxide (CO₂). The presence of GHGs in our atmosphere is essential to life, otherwise the planet would freeze over, but too many GHGs in our atmosphere will have dramatic and possibly dire consequences for the nature of our climate.

The second undeniable fact is that the concentration of many GHGs in our atmosphere has been rapidly increasing due to human activity. Many associate changes to the global climate as a phenomenon which will only be felt in a distant place in the distant future. However, climate change will in fact be felt right here in the Northwest and many predicted effects are already becoming reality. The King County website lists some of the effects from climate change we can expect to experience in the Cascadia region.

<http://www.kingcounty.gov/property/permits/info/SiteSpecific/ClimateChange.aspx>

Water and Snow

- Decreased water for irrigation, fish, and summertime hydropower production and increased urban demand for water, leading to increased conflicts over the resource.
- Warmer winter temperatures and increased winter precipitation are projected to reduce the winter snowpack. This will also delay the opening of the ski season, shorten the length of the season, and increase the likelihood of rain when ski areas are open. The impacts are

greater for mid-elevation ski areas (~3,000 to 4,000 feet) than for those at higher elevations.

Salmon

- Increased difficulties for migration and spawning due to increased winter floods, decreased summer stream flow, and increased water temperatures.

Forests

- Potential increases in forest fires.
- Overall, the Pacific Northwest is likely to see increased forest growth region-wide over the next few decades followed by decreased forest growth as temperature increases overwhelm the ability of trees to make use of higher winter precipitation and higher carbon dioxide.

Wildlife

- Potential for extinction of local populations and loss of biological diversity if environmental shifts outpace species migration rates and interact negatively with population dynamics.

Coastal Flooding and Erosion

- Increased coastal erosion and beach loss due to rising sea levels
- Increased landslides due to increased winter rainfall
- Permanent inundation, especially in south Puget Sound around Olympia
- Increased coastal flooding due to sea level rise and increased winter stream flow from interior and coastal watersheds.

Agriculture

- Many crops will grow better with higher CO₂ levels and increase longer growing seasons before temperatures substantially increase, provided there is sufficient water. However, some pests, weeds, and invasive species will be similarly advantaged. Low-value irrigated crops may have difficulty competing for less abundant water.

In response, a GHG report is becoming common practice for the Air section of the WA SEPA Environmental Checklist. This report is intended to provide a rough estimate of the GHGs released over the lifespan of a given project. In this report there will be an estimation of the GHGs released from the current facilities and also an estimate of GHGs released if the proposed project or alternative was carried out.

The emissions calculation is broken up into three sections. The first section is embodied emissions which represent the emissions released during the construction phase of the project. The second section is energy emissions which represent the emissions from energy use after the buildings have been constructed over the course of the building's lifespan. The third section is

transportation emissions which represent the emissions associated with the vehicle use of a building's occupants. The specifics of these calculations can be found in Appendix.

The calculated total emissions are not intended to be a precise figure but rather a conservative estimate. The actual emission levels are likely slightly higher due to a number of externalities which are difficult to quantify. Despite this, the worksheet and resulting figure is considered accurate enough to provide a general idea of the GHG levels associated with a given project. GHG emission calculation is a relatively new process though, so as better techniques are developed and existed techniques are refined, more accurate estimates should be possible in the future.

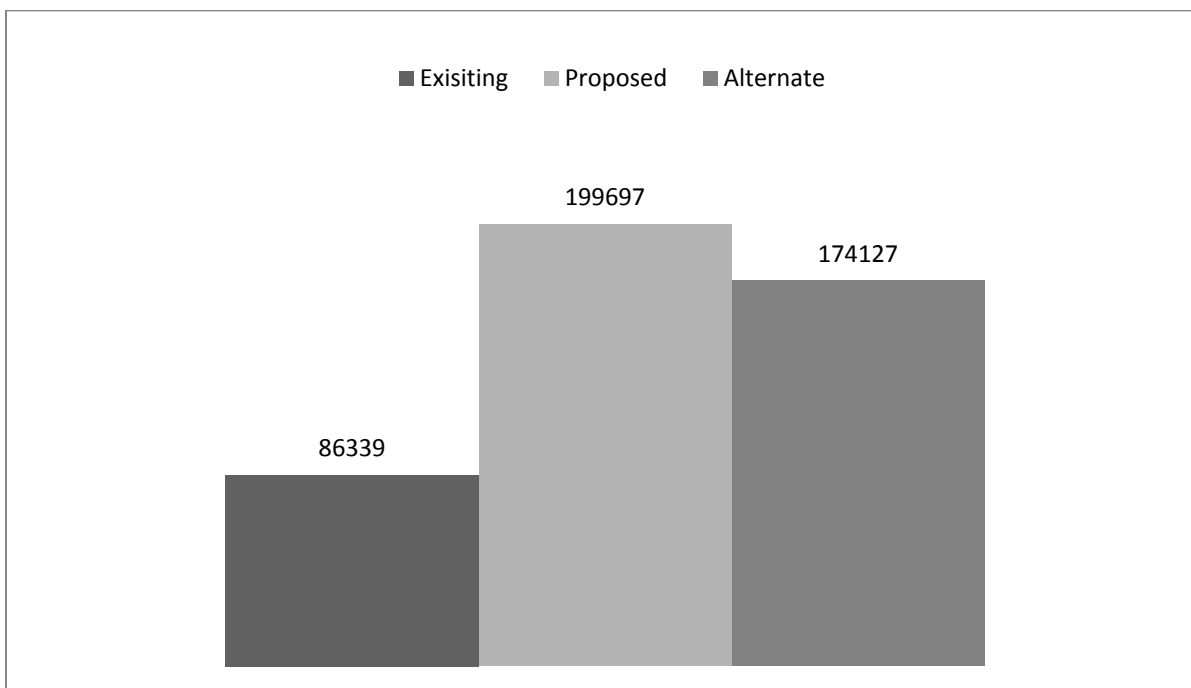


Figure 6 Total GHG Emissions (Metric Tons of CO₂ Equivalent).

PLANTS AND ANIMALS

Proposed Action

Plant diversity on the Barlean's site is sparse – most species diversity is located in the already developed 10 acres located on the Southeast corner of the property. These species include some coniferous trees, deciduous trees such as red alder, grass and pasture, and some wet soil plants, including buttercup and bullrush. The remaining 30 acres are regularly mowed pasture. Introducing a 25 foot native vegetation buffer is expected to increase plant diversity in the area, particularly in coniferous trees and shrubs.

Animals observed on the Barlean's property include songbirds, rabbits, and predatory birds including hawks and eagles. Introducing a vegetation border around the edge of the property would likely increase habitat for songbirds and rabbits. Hawk and eagle predation may increase in the area.

Preferred Alternative

Plant diversity is expected to increase in the external 25 rezoned acres, due to the proposed 50 foot vegetation buffer. More of the cultivated pasture will return to native vegetation.

Introducing a vegetation border around the edge of the property would likely increase habitat for songbirds and rabbits. Hawk and eagle predation may increase in the area.

No Project Action

There is no expected positive or negative impact on plant species. Animal diversity and population size is expected to remain constant.

TRANSPORTATION

Proposed Action

The site is served by two public roads, Lake Terrell Road and Slater Road. Entrance to the property is primarily off of Lake Terrell Road, the lesser used road, while an exit-only driveway is located on Slater Road (Figure 1). The proposed expansion will result in an increase in the number of trucks bringing raw materials in and shipments of processed product out. Slater Road as well as Lake Terrell Road are major collector roads that already serve the nearby Heavy Impact Industrial (HII) uses and so any increased traffic due to the proposed expansion would have little adverse impact. The access site off of Lake Terrell Road would also receive heavier traffic under the proposed expansion, as additional storage facilities and loading areas would be located off that access point. Though the proposal will not require any new public roads or streets, nor any improvement to existing roads, internal roads leading to the loading docks and storage buildings will be constructed to accommodate the increased uses. All transportation is by truck and the project will not utilize any of the port, rail, or air transportation in the immediate vicinity.

The completed project would generate one semi- truck load every two days for Flax raw material and two to three trucks per day to load finished flax product. Trucks will be coming in and out of the site twice a day during fishing season and approximately 20 private vehicle trips per day will occur to purchase processed fish, also during fishing season. Peak volumes would generally occur during regular business hours.

According to the site plan the completed project would create an additional 85 parking spaces while eliminating none of the existing parking spaces.

Concerns were raised about potential adverse impacts from increased traffic. To address these concerns the Development Agreement restricts vehicle access to the site from Walltine Road protecting the scattered rural residences located in the vicinity. Significant landscaping would be required to further buffer rural properties from traffic impacts.

Preferred Alternative

The proposed boat storage building would be removed completely from the development proposal, and the adjacent seed storage building would be relocated closer to the internal access road off of Lake Terrell Road. This would effectively eliminate a significant portion of the proposed internal access roads as well as approximately 20 of the additional parking spaces that were associated with the removed building.

Concerns about increased traffic due to business expansion were voiced by a number of rural property owners bordering the site. Increasing the vegetative buffer between the site access points and loading areas and the bordering rural zones will help mitigate adverse impacts from any increased traffic.

No Project Action

Not applicable; as traffic would not be increased if business expansion did not occur.

ENERGY AND NATURAL RESOURCES

Proposed Action

The buildings proposed through the Development Agreement would increase site energy use, specifically in electricity, which is currently supplied through Puget Sound Energy, and propane, which heats all the buildings. Electricity and propane demand will increase in proportion to the amount of building space to be heated, and the increase of industrial processes. Propane use is anticipated to be more efficient in the future, as a result of newer technologies. Electricity use is expected to be higher in the proposed packaging plant than in the storage buildings.

Preferred Alternative

The energy impacts of the Preferred Alternative are expected to be similar to those of the Proposed Action, but on a smaller scale, directly related to the removal of the dry boat storage building (Figure 5).

No Project Action

Electricity is currently provided to the site from Puget Sound Energy. All existing buildings are heated with propane. There would be no additional impacts from energy use if building is not expanded.

AESTHETICS

Proposed Action

In the development agreement, the proposed buildings will all have corrugated steel as the exterior building material. All proposed buildings will be 30 feet high at the peak. The maximum allowed building height within the LII designation is 35 feet, according to WCC 20.66.400. Views from the residential area on Walltine Road toward the forested area of the Lummi Reservation would be altered and partially obstructed through the construction of the buildings. As part of the development agreement, a 25 foot wide native vegetation buffer will be planted along Walltine Road to the North, near the R5A neighbors and to the east. This will obscure the proposed pole buildings from view.

Preferred Alternative

The vegetation border will be extended from 25 feet wide to 50 feet wide (Figure 5). This will aid in obscuring the proposed pole buildings from view.

No Project Action

The visual character of the site will not be altered.

LIGHT AND GLARE

Proposed Action

The four pole buildings proposed in the development agreement may produce some glare in the daytime, since the exterior material is corrugated steel. Some glare may be produced during all hours of the day as the sun travels across the sky, producing the most glare on the Western side of the buildings in the evening, which borders a forested area (Figure 1). Perimeter lights around each building would be the only influential source of light introduced in the proposal. Because the Barlean's facility employs workers at all hours, light impacts are expected to be largest during night. The vegetation buffer proposed along the north, bordering Walltine Road, should aid in mitigating light impacts from the construction of the pole buildings. Increased light and glare is not a safety hazard. However, it would influence views from the residential area.

Preferred Alternative

The suggested project alternative would produce the same impacts as the proposed action, but to a lesser degree. The 50 foot wide preferred vegetation buffer bordering Walltine Road should reduce light and glare impacts for the residential area (Figure 5).

No Project Action

No impacts are anticipated.

NOISE

Proposed Action

There is existing noise coming from the northwest typical of the heavy impact industrial uses present in the area. To the north, east, and south, little noise is generated by scattered rural residential uses. Operational noise inside the processing facilities is moderate and is generally heard only in close proximity to the buildings. While traffic from large shipping trucks produces much of the noise on site, the basic industries do not generate excess noise.

The additional development would produce minimal noise, as three of the four proposed buildings are planned for storage. The noise impact would mainly be short-term, and largely associated with the construction of the new buildings. As all raw materials and finished products are shipped by trucks (UPS and FedEx), possible long-term impacts would come from an increase in noise generated by these vehicles, and would primarily take place during regular business hours.

Proposed measures to reduce or control noise impacts include restricting access to the site through Walltine Road at the northern border of the property directly adjacent to residential properties. This would moderate the amount of direct traffic noise bordering the residential area. Additionally, the 5 acres that will remain as R5A zoning, located along the northeastern corner of the property, is purposed to create an additional buffer between the new expansion and the existing rural property owners living to the north and northeast of the site.

In a further effort to reduce the noise impact the Development Agreement requires substantial landscaping minimum 50- foot setbacks from all properties zoned Rural and the country road. A 25- foot planted buffer will be established along all property lines adjacent to rural zoning. The new buildings authorized by the Development Agreement will be located as far from the northern and eastern boundary of the site as is practicable.

Preferred Alternative

Rural property owners to the north and northwest of the site along Walltine Road have expressed opposition to and concern about increased noise resulting from the proposed Site Specific Rezone. To mitigate this concern the vegetative buffer, designated in the Development Agreement, will be expanded in order to decrease potential noise impacts on the surrounding residential areas. An additional 25-feet of vegetative buffer will be required, extending the total distance between the rezone and the neighboring Rural zoned properties to 100 feet. Modification of the proposed building sites will reduce industrial expansion towards residential areas and further mitigate potential noise impacts.

No Action Alternative

The site meets current noise standards of both the Whatcom County Code and the Washington Administrative Code for properties bordering residential areas. If no development were to occur, no new measures would be needed to reduce impacts of noise.

HISTORIC AND CULTURAL PRESERVATION

Proposed Action

The proposed plan for building four new facility buildings, a drainage pond, and paved or graveled roadways to the proposed buildings, on an additional 25 acres of hay field lands outside the existing organic oils manufacturing facility are not likely to pose any harm or cause adverse effects to the preservation of historic or cultural items, goods, or artifacts. Barlean's rezone will not include places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site. The Barlean's site is void of any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

In considering proposed measures to control impacts against the finding of historical or cultural items, goods, or artifacts; the county has adopted the following condition based on the recommendations from the Lummi Nation Tribal Historic Preservation Office:

Should archaeological materials (e.g. shell midden, faun remains, stone tools) or human remains be observed during project activities, all work in the immediate vicinity shall stop, and the area shall be secured. The State Office of Archaeology and Historic Preservation (360-586-3065) and the Lummi Nation Tribal Historic Preservation Office (360-384-2298) shall be contacted immediately in order to help assess the situation and determine how to preserve the resource(s). Compliance with all applicable laws pertaining to archaeology resource required.

The above is based according to the Whatcom County Planning and Development Services Staff Report dated November 29, 2010 (Exhibit #2), Section 5. Public Notice and Comment; Notice of SEPA Threshold Determination: *The notice of decision for the determination of non-significance (DS) for this project was issued on November 2, 2010. The notice was also sent to state and local agencies, and Parties of Record for the project. The county received two comments.*

Lummi Nation Tribal Historic Preservation Office (LNTHO) - Based on review, an archaeological assessment is not recommended as this time. While the presence of cultural resources are not anticipated, please insert the following inadvertent discovery language...The language recommended by the LNTHPO is, word for word, the indented statement insert is the paragraph seen above.

Finally, the Whatcom County Planning and Development Department states that the statement condition provided by the LNTHPO will be a condition that will be added to all building permits on the subject property.

Preferred Alternative

Barlean's Organic Oils' preferred alternative will be consistent, in exact phrasing, to the recommended language provided by the LNTHPO and adapted by the Whatcom County Planning and Development Department for the rezone and any and all pursuant permits on the Barlean Property. See the second paragraph indented italicized text: *Should archaeological materials ...laws in pertaining to archaeology resource required.* This text will be required and is essential in maintaining respect for the Lummi Nation, neighbors to the south of Slater Rd. Whatcom County should maintain compliance with the; Antiquities Act of 1906, National Historic Preservation Act of 1966, and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990. See The WA State Department of Archaeology and Historic Preservation web site for all other applicable laws pertaining to this subject matter - <http://www.dahp.wa.gov/pages/EnvironmentalReview/Laws.htm>.

No Project Action

The No Project Action plan for Barlean's 40 acre site is based on no rezone or any other permitted uses on the land other than what is already being used in their current operations under their CUP. Any potential archaeological or historic resources would not be impacted due to the land remaining as it had before the rezone approval.

ENVIRONMENTAL HEALTH

Proposed Action

The manufacturing process does not contain any toxic chemicals nor does it generate hazardous waste. The expansion of flaxseed production and the construction of the four proposed buildings will be low impact and will not lead to any emissions of toxic gases, fumes or hazardous wastes.

Special Emergency Services

No additional emergency services will be required; all proposed building will have adequate fire suppression systems established. The current fire suppression system includes sprinkler systems within the buildings, four hydrants, a commercial fire loop pipe and fire hoses. Maintenance crews are trained to use the existing fire suppression system in order to minimize damage until fire crews can arrive.

As each industry is required to continuously employ the best pollution control technology when reasonable and practicably available, the appropriate standards will be followed and measures taken to reduce or control environmental health hazards.

Preferred Alternative

No significant differences from the proposed action.

No Project Action

No additional measures are required to reduce or control environmental hazards as the current production does not generate any hazardous wastes, and the existing buildings have standardized emergency measure in place.

EARTH**Proposed Action**

The Barlean's property is located on three different soil types: Birch Bay Silt Loam, on which most of the buildings are situated, Whitehorn Silt Loam, located in the Southeastern corner of the property, and Kickerville silt loam and located in the north-central portion of the property. The greatest slope on site is 6%, though slopes of 0% to 15% have been indicated. Because of the relatively flat slope of the property, erosion is not a concern. No fill is anticipated for construction of the proposed expansion. Impervious surface area will increase from 6.5% initially, to 33.3% through the construction of roads and four 20,000 square foot buildings (Figure 4).

Preferred Alternative

No fill is anticipated for construction of the proposed expansion. Impervious surface area will increase from 6.5% initially, to 11.8 % through the construction of roads and three 20,000 square foot buildings (Figure 5).

No Project Action

Impervious surface area will remain at 6.5% of the entire property (Figure 3).

Table 1 Decision Matrix

Barlean's Organic Oils: Decision Matrix Based on the Goeller Scorecard			
Criteria	Proposed Action	Alternative	No Action
Air & Water			
Emissions (x2)	0	1 (2)	2 (4)
Public Water Utility	1	1	2
Runoff/impervious surface (x2)	0	1 (2)	2 (4)
Surface Water	0	1	2
Economic			
Jobs (x6)	4 (24)	4 (24)	2 (12)
Revenue (x10)	4 (40)	3 (30)	2 (20)
Plants/Habitat			
Buffer (x2)	3 (6)	4 (8)	2 (4)
Wetland (x2)	0	1 (2)	2 (4)
Vehicular Impact			
Traffic	1	1	1
EIA Checklist Criteria	Proposed Action	Alternative	No Action
Aesthetics			
Noise/Visual	1	1	2
Land Use	0	1	2
Cultural Preservation			
Lummi Archeological Resources	0	1	2
Environmental Health			
Flax Waste Disposal	1	1	2
Earth			
Soil	0	1	2
Environmental/Social Impacts			
	10	22	32
Economic Benefits			
	64	54	32
Total/Sum			
	74	76	64
Relative Total Score			
	+10	+12	0
Ranking			
Multiplier is distinguished by best to worst alternative:			
0 – significant downgrade			
1 – minor downgrade			
2 – no change			
3 – minor upgrade			
4 – significant upgrade			
(The multiplier is assigned relative to each categorical plan; proposed, alternative, and no-action)			

Table 1 Continued

Weighting

The weighting is viewed through a triple-bottom-line/sustainability indexing context. The economic benefit is balanced against environmental/social impacts with a total of 32 points assigned to each proposal. Economic = 16 points, and environmental/social = 16 points, totaling 32 points.

Criterial rank is based on a 1-10 scale; a value of 1 establishes identifiable criterial consideration/inclusion and is of least importance, while a value of 10 establishes the most important criteria. All other numbers that fall between 1 and 10 are relative to 1 or 10 in the 1-10 scale range.

DECISION MATRIX

The decision matrix used for weighting and ranking criteria on the Barlean's rezone, and alternatives is based on the Goeller Scorecard (Clemons and McBeth 2009, 133). The Goeller Scorecard is a policy tool that helps inform, to those stakeholders involved or affected by the rezone, how each plan variation compares relative to the others. Goeller Scorecards should not be considered an absolute science and contain weighted and ranked criteria based on all available information gathered in the time allotted to complete a given project. The ranking and weight of the criteria in relation to other criteria can be subjective but is based on values found and considered for all stakeholders and attempts to separate any bias.

Given the wide range of criteria required for Washington State SEPA EIS documentation; the decision matrix for Barlean's Organic Oils rezone provides a concise table that allows those criteria, most pertinent to the project proposal and alternatives, to be evaluated and compared. In deciding how to determine a point system and balance for the given criteria the decision matrix is aimed towards accomplishing a sustainability index for the rezone proposals and expansion of facility operations. Sustainability can also be interpreted in a business, societal, and environmental context, often called the triple-bottom-line.

Typically the triple-bottom-line (Savitz and Weber, 2006) accounts for criteria under each of the environmental/economic/social impact topics. Under economic determinations, the criterion are usually; profit, taxes paid, monetary flows, and jobs created. The Environmental is; Air and water quality, energy usage, and waste produced. Finally, the social considers; labor practice, community impacts, human rights, and product responsibility. For Barleans' rezone the triple-bottom-line concept was balanced by considering all criteria and was found that economic/business considerations would be considered against, and with, environmental and social impacts.

There are 8 criterial categories and 14 subcategories. The 14 subcategories are considered pertinent criterion and are the actual criteria used. Twelve of the criteria are environmental and social, and two are economic/business criteria.

The main purpose of the expansion is to expand processing capacities and bring in additional revenue to Barlean's Organic Oils operations. By expanding its operational manufacturing and processing facilities, Barlean's will also add 20 permanent jobs to the site and some temporary

construction jobs during the building phase of the new facility structures. Economic growth is important to the community and for the company, thus has strong stakeholder support for the rezone and expansion proposal.

To balance the criteria and impacts of the Barlean's proposal we assigned 32 points total for all criteria. Quantification of economic weighting was balanced at 16 points, and environmental and social impacts were determined according to criteria decided in analyzing the results of the SEPA checklist determinations – 16 points.

Weighting Explanation

As mentioned above, economic and business concerns are heavily weighted because they garner a lot of local attention and traction, especially in the county. Jobs and economic growth provides income to additional people in the community and is considered a stabilizing and capacity building factor. Barlean's rezone allows for the expansion of Light Industrial Impacts to an additional 25 acres of rural-5 zoned land. Though the environmental impacts are relatively minor the economic impacts are somewhat significant. 20 Jobs means 20 more people are employed and using that income to produce more economic strength to the local economy. It was also important to consider revenue and fortifying a successful local business that is willing and able to operate in the county and not move its operation out of the county, state or even country.

The environmental impacts and social considerations are not to be ignored either. They don't have the large multipliers like jobs or revenue, but are numerous and varied. Relatively speaking, environmental and social criteria do carry a lot of consideration because WA SEPA requires them to be considered. The separation of environmental, social, and economic impacts is often arbitrary leaving a wide grey area left to the discretion and value judgments of those evaluating them. For the purposes of evaluating Barleans' criteria, social could and does, in many degrees, play a major factor in determining the weighting and ranking of each criterion against each alternative. When evaluating jobs, the social value that underlies what those additional jobs provide, the final ranking and weight behind job creation are significant, based on the social value provided by the economic value.

Air emissions are important to consider and by building the facility structures put forth in the plan proposal, greenhouse gas emissions will rise but be limited to lower criterial importance – a multiplier of x2 (see the Air section under Impacts and appendix for a full GHG report).

The building of impervious surfaces will increase the runoff by a factor of 2, yet will be limited by a weighting congruent to emissions. For both runoff and emission, the weighting set against each plan (proposed plan, alternative, and no action) has a relative ranking. The ranking system is on a 0-4 scale. See the section below for a more detailed explanation of the ranking system.

The plants and habitat category also held two criterion; buffer and wetland, both holding a relative weighting factor of x2. The buffer zone is important because of its beneficial impact environmentally and the Barlean's facility is a more intense use than would be expected for this particular plot of land. The buffer will block, to the extent it will served the purpose its designed to perform, noise and blighted views of the light industrial expansion and impacts that encroach toward the residential neighbors along Walltine Road.

The remaining environmental and social criteria hold mentionable significance yet meet a minimum impact criteria standard. They are worth mentioning and must be considered for future building permits and their possible impacted effects. These include; traffic, noise/visual aesthetics, potential cultural preservation of Lummi Nation archaeological resources, the environmental health effects from flax waste disposal, and finally soil impacts from land use change and development.

Ranking and Relative Comparison of Plans

The ranking or multiplier is distinguished between best to worst alternative and is on a 0-4 scale. Where a 0 value is a significant downgrade and a 4 value distinguishes a significant upgrade. A value of 2 designates no change in the plan. These are provided under the each plan to compare their relative significance to the next plan and help inform, to the stakeholder, an accessible way to view the criteria and their impacts in each of the three designated plans.

The rankings are then multiplied with the weighting of the criteria and added together for each column plan. The totals are measured and can be viewed as a total relative score.

REFERENCES (American Political Science Association)

- Clemons, Randy S. and Mark K. McBeth. 2008. *Public Policy Praxis: A Case Approach for Understanding Policy and Analysis*. 2nd ed. Upper Saddle River, New Jersey: Prentice-Hall, Inc.
- Savitz, Andrew W. and Karl Weber. 2006. *The Triple Bottom Line: How Today's Best-Run Companies Are Achieving Economic, Social and Environmental Success -- and How You Can Too*. 1st ed. San Francisco, CA: Jossey-Bass/Wiley.

GHG Appendix

The following information is taken directly from the King County GHG worksheet.

Definition of Building Types

Type (Residential) or Principal Activity (Commercial)	Description
Single-Family Home	Unless otherwise specified, this includes both attached and detached buildings
Food Sales	Buildings used for retail or wholesale of food.
Office	Buildings used for general office space, professional office, or administrative offices. Doctor's or dentist's office are included here if they do not use any type of diagnostic medical equipment (if they do, they are categorized as an outpatient health care building).
Warehouse and Storage	Buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings (such as self-storage).
Other	Buildings that are industrial or agricultural with some retail space; buildings having several different commercial activities that, together, comprise 50 percent or more of the floorspace, but whose largest single activity is agricultural, industrial/ manufacturing, or residential; and all other miscellaneous buildings that do not fit into any other category.

Embodied Emissions

Type (Residential) or Principal Activity (Commercial)	# thousand feet ² / unit or building	Life span related embodied GHG missions (MTCO _{2e} / unit)
Single-Family Home	2.53	98

	Columns and Beams	Intermediate Floors	Exterior Walls	Windows	Interior Walls	Roofs		
Average GWP (lbs CO _{2e} / ft ²): Vancouver, Low Rise Building	5.3	7.8	19.1	51.2	5.7	21.3		
Average Materials in a 2,272-foot ² single family home	0.0	2269.0	3206.0	285.0	6050.0	3103.0	Total Embodied Emissions (MTCO _{2e})	Total Embodied Emissions (MTCO _{2e} / thousand feet ²)
MTCO _{2e}	0.0	8.0	27.8	6.6	15.6	30.0	88.0	38.7

Residential floor space per unit

2001 Residential Energy Consumption Survey (National Average, 2001)
 Square footage measurements and comparisons
<http://www.eia.doe.gov/emeu/recs/sqft-measure.html>

Average GWP (lbs CO₂e/sq ft):
Vancouver, Low Rise Building

Athena EcoCalculator
Athena Assembly Evaluation Tool v2.3- Vancouver Low Rise Building
Assembly Average GWP (kg) per square meter
<http://www.athenasmi.ca/tools/ecoCalculator/index.html>

Lbs per kg	2.20
Square feet per square meter	10.76

Average Materials in a 2,272-square
foot single family home

Buildings Energy Data Book: 7.3 Typical/Average Household
Materials Used in the Construction of a 2,272-Square-Foot Single-Family
Home, 2000
http://buildingsdatabook.eren.doe.gov/?id=view_book_table&TableID=2036&t=xls
See also: NAHB, 2004 Housing Facts, Figures and Trends, Feb. 2004, p. 7.

Average window size

Energy Information Administration/Housing Characteristics 1993
Appendix B, Quality of the Data. Pg. 5.
<ftp://ftp.eia.doe.gov/pub/consumption/residential/rx93hcf.pdf>

Background Information on Embodied Emissions

Buildings

Embodied GHG emissions are emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass). Estimating embodied GHG emissions is new field of analysis; the estimates are rapidly improving and becoming more inclusive of all elements of construction and development.

The estimate included in this worksheet is calculated using average values for the main construction materials that are used to create a typical family home. In 2004, the National Association of Home Builders calculated the average materials that are used in a typical 2,272 square foot single-family household. The quantity of materials used is then multiplied by the average GHG emissions associated with the life-cycle GHG emissions for each material.

This estimate is a rough and conservative estimate; the actual embodied emissions for a project are likely to be higher. For example, at this stage, due to a lack of comprehensive data, the estimate does not include important factors such as landscape disturbance or the emissions associated with the interior components of a building (such as furniture).

King County realizes that the calculations for embodied emissions in this worksheet are rough. For example, the emissions associated with building 1,000 square feet of a residential building will not be the same as 1,000 square feet of a commercial building. However, discussions with the construction community indicate that while there are significant differences between the different types of structures, this method of estimation is reasonable; it will be improved as more data become available.

Additionally, if more specific information about the project is known, King County recommends

two online embodied emissions calculators that can be used to obtain a more tailored estimate for embodied emissions:

www.buildcarbonneutral.org
www.athenasmi.ca/tools/ecoCalculator/.

Pavement

Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle. For specifics, see the worksheet.

Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle.

The results of the studies are presented in different units and measures; considerable effort was undertaken to be able to compare the results of the studies in a reasonable way. For more details about the below methodology, contact Matt Kuharic (matt.kuharic@kingcounty.gov.)

The four studies, Meil (2001), Park (2003), Stripple (2001) and Treolar (2001) produced total GHG emissions of 4-34 MTCO_{2e} per thousand square feet of finished paving (for similar asphalt and concrete based pavements). This estimate does not including downstream maintenance and repair of the highway. The average (for all concrete and asphalt pavements in the studies, assuming each study gets one data point) is ~17 MTCO_{2e}/thousand square feet.

Three of the studies attempted to thoroughly account for the emissions associated with long term maintenance (40 years) of the roads. Stripple (2001), Park et al. (2003) and Treolar (2001) report 17, 81, and 68 MTCO_{2e}/thousand square feet, respectively, after accounting for maintenance of the roads.

Based on the above discussion, King County makes the conservative estimate that 50 MTCO_{2e}/thousand square feet of pavement (over the development's life cycle) will be used as the embodied emission factor for pavement until better estimates can be obtained. This is roughly equivalent to 3,500 MTCO_{2e} per lane mile of road (assuming the lane is 13 feet wide).

It is important to note that these studies estimate the embodied emissions for roads. Paving that does not need to stand up to the rigors of heavy use (such as parking lots or driveways) would likely use less materials and hence have lower embodied emissions.

Sources:

Meil, J. A Life Cycle Perspective on Concrete and Asphalt Roadways: Embodied Primary Energy and Global Warming Potential. 2006. Available:

Residential
floorspace per unit

2001 Residential Energy Consumption Survey (National Average, 2001)
Square footage measurements and comparisons
<http://www.eia.doe.gov/emeu/recs/sqft-measure.html>

	Single Family Homes	Multi-Family Units in Large & Small Buildings	All Residential Buildings
New Housing Construction, 2001	1,273,000	329,000	1,602,000
Existing Housing Stock, 2001	73,700,000	26,500,000	100,200,000
Replacement time:	57.9	80.5	62.5 (national average, 2001)

Average lifespan of buildings, estimated by replacement time method

Note: Single family homes calculation is used for mobile homes as a best estimate life span.

Note: At this time, KC staff could find no reliable data for the average life span of commercial buildings.

Therefore, the average life span of residential buildings is being used until a better approximation can be ascertained.

Sources

New Housing Construction, 2001 [Quarterly Starts and Completions by Purpose and Design - US and Regions \(Excel\)](http://www.census.gov/const/quarterly_starts_completions_cust.xls)
http://www.census.gov/const/quarterly_starts_completions_cust.xls
See also: <http://www.census.gov/const/www/newresconstindex.html>

Existing Housing Stock, 2001 [Residential Energy Consumption Survey \(RECS\) 2001](http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf)
[Tables HC1:Housing Unit Characteristics, Million U.S. Households 2001](http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf)
[Table HC1-4a. Housing Unit Characteristics by Type of Housing Unit, Million U.S. Households, 2001](http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf)
[Million U.S. Households, 2001](http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf)
http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf

Background Information on Energy Emissions

This section helps estimate the GHG emissions associated with energy used after the building has been constructed. It includes energy used by an average building. All estimates in this section are based on national average building energy usage from the Energy Information Administration and from the Department of Energy’s Buildings Energy Data Book.

An important part of this estimate, as well as the transportation related estimate described in the next section, is to determine the average life span of buildings. This is not an easy task and no

uniform estimates have been documented. However, one way to estimate building life spans is to estimate the ratio of the number of existing building units to that of annually constructed new units. This is the method employed in this worksheet. This method is most likely an underestimate of average building life spans as it does not account for growth in the total overall number of buildings. When compared with a literature review, the average life span of 62.5 years per building used in this worksheet is conservative but reasonable (e.g., 80-100 year average U.S. building service life reported by the Environment Policy Committee).

Environment Policy Committee. Design of Sustainable Building Policies: Scope for Improvement and Barriers. Organisation for Economic Co-operation and Development. Available:

[http://www.oecd.org/olis/2001doc.nsf/43bb6130e5e86e5fc12569fa005d004c/203e895174de4e56c1256bd7003be835/\\$FILE/JT00128164.PDF](http://www.oecd.org/olis/2001doc.nsf/43bb6130e5e86e5fc12569fa005d004c/203e895174de4e56c1256bd7003be835/$FILE/JT00128164.PDF)

Transportation Emissions

"# people or employees/ thousand feet²" figures were adjusted for each section to match the actual and estimated total number of employees.

Type (Residential) or Principal Activity (Commercial)	# people/unit or building	# thousand feet ² /unit or building	# people or employees / thousand feet ²	vehicle related GHG emissions (metric tons CO ₂ e /person/year)	MTCO ₂ e / year/unit	MTCO ₂ e/ year/ thousand feet ²	Average Building Life Span	Life span transportation related GHG emissions (MTCO ₂ e/unit)	Life span transportation related GHG emissions (MTCO ₂ e/ thousand feet ²)
Existing									
Single-Family Home	2.8	2.53	1.1	4.9	13.7	5.4	57.9	792	313
Food Sales	15.1	5.6	2.7	4.9	74.6	13.3	62.5	4664	833
Office	84.4	14.8	5.7	4.9	416.1	28.1	62.5	26024	1758
Warehouse and Storage	30.4	16.9	1.8	4.9	150.0	8.9	62.5	9384	555
Other	52.6	21.9	2.4	4.9	259.2	11.8	62.5	16214	740
Proposed & Alternate									
Office	28.1	14.8	1.9	4.9	138.7	9.4	62.5	8675	586
Warehouse & Storage	3.4	16.9	0.3	4.9	16.7	1.0	62.5	1043	62
Other	6.6	21.9	0.4	4.9	32.4	1.5	62.5	2027	93

Sources

All data in black text King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

people/unit Estimating Household Size for Use in Population Estimates (WA state, 2000 average)
 Washington State Office of Financial Management
 Kimpel, T. and Lowe, T. Research Brief No. 47. August 2007
<http://www.ofm.wa.gov/researchbriefs/brief047.pdf>
 Note: This analysis combines Multi Unit Structures in both large and small units into one category; the average is used in this case although there is likely a difference

Residential floor space/unit 2001 Residential Energy Consumption Survey (National Average, 2001)
 Square footage measurements and comparisons
<http://www.eia.doe.gov/emeu/recs/sqft-measure.html>

#employees/
thousand feet² Commercial Buildings Energy Consumption Survey commercial energy uses and costs
(National Median, 2003)
Table B2 Totals and Medians of Floor space, Number of Workers,
and Hours of Operation for Non-Mall Buildings, 2003
http://www.eia.doe.gov/emeu/cbeecs/cbeecs2003/detailed_tables_2003/2003set1/2003excel/b2.xls
Note: Data for # employees/thousand square feet is presented by CBECS as square
feet/employee.
In this analysis employees/thousand square feet is calculated by taking the inverse of the
CBECS number and multiplying by 1000.

Vehicle related GHG emissions

Estimate is calculated as follows (Washington State, 2006)

56,531,930,000 2006 Annual WA State Vehicle Miles Traveled

Data was daily VMT. Annual VMT was 365*daily VMT.
<http://www.wsdot.wa.gov/mapsdata/tdo/annualmileage.htm>

6,395,798 2006 WA state population

<http://quickfacts.census.gov/qfd/states/53000.html>

8839 vehicle miles per person per year

0.0506 gallon gasoline/mile

This is the weighted national average fuel efficiency for all cars and 2 axle, 4 wheel light trucks in 2005. This includes pickup trucks, vans and SUVs. The 0.051 gallons/mile used here is the inverse of the more commonly known term "miles/per gallon" (which is 19.75 for these cars and light trucks). Calculations based on weighted average MPG efficiency of cars and light trucks.

http://cta.ornl.gov/data/tebd26/Edition26_Chapter04.pdf

Note: This report states that in 2005, 92.3% of all highway VMT were driven by the above described vehicles.

http://cta.ornl.gov/data/tebd26/Spreadsheets/Table3_04.xls

24.3 Pounds CO₂e/gallon gasoline

The CO₂ emissions estimates for gasoline and diesel include the extraction, transport, and refinement of petroleum as well as their combustion.

Life-Cycle CO₂ Emissions for Various New Vehicles. RENew Northfield.

Available: <http://renewnorthfield.org/wpcontent/uploads/2006/04/CO2%20emissions.pdf>

Note: This is a conservative estimate of emissions by fuel consumption because diesel fuel, 2205

4.93 lbs/metric ton with an emissions factor of 26.55 lbs. CO₂e/gallon was not estimated.

vehicle related GHG emissions (metric tonnes CO₂e per person per year)

average life span of buildings, estimated by replacement time method See Energy Emissions Worksheet for Calculations

Commercial floor space per unit

EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)

Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003

http://www.eia.doe.gov/emeu/cbeecs/cbeecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls

Background Information on Transportation Emissions

This section helps estimate the emissions associated with transportation of building occupants. At this time, it is based on average vehicle miles traveled by the average Washington State citizen.