Leichner Property
Fatal Flaw Analysis of Potential Reuses

Clark County, Washington

May 2012

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Executive Summary

Clark County Environmental Services contracted with BergerABAM in February 2012 to perform a fatal flaw analysis of potential reuses for the Leichner Landfill and adjacent Koski property. This work assumes that, if the purchase proceeds, the County will engage in a more in-depth master planning process.

BergerABAM analyzed several categories of risks associated with the potential reuse alternatives developed by Environmental Services. These categories included the compatibility of the reuses with the County's current zoning and comprehensive plan and their environmental constraints, community impacts, fiscal implications, and engineering challenges.

Findings and conclusions include:

- Damage to the landfill cap presents significant concerns regardless of the type of use that causes the damage or threatens its integrity.
- Reuse of the landfill site faces significantly more environmental and regulatory constraints.
- Reuses placed on the landfill cap are likely to incur significantly higher design and permitting costs.
- Fiscal and engineering opportunities and challenges will require much more extensive analysis to guide County redevelopment decisions based on cost/benefits and return on investment calculations.
- The existing zoning and comprehensive plan designations provide considerable economic development opportunities.
- Taken separately, the Koski property offers significantly more options for reuse with lower risks in virtually every category considered.

Based on this analysis, uses with likely fatal flaws include:

- Waste-to-energy and biomass energy production alternatives. Significant barriers, such as regulatory permitting, environmental impacts, and community impacts, likely constitute fatal flaws. (Solar represents the only viable energy generation option.)
- Without significant environmental and engineering study, any reuse on the capped landfill, other than low-impact recreation, urban agriculture, solar energy production, or environmental enhancement (open space), appears to pose significant threat and therefore has a potential fatal flaw.
- Taken separately, the only uses on the Koski property identified with clear fatal flaws are waste to energy and biomass energy generation. All other uses carry significantly less risk.

Although this analysis identified potential fatal flaws with several reuses, it should not be construed to indicate there are inherent difficulties in all reuses.

The Koski property has potential for light industrial development and job creation as the economy recovers and could be used for a multitude of other uses. The capped landfill, even with its regulatory barriers, presents an opportunity for low-impact recreation and solar energy generation.


99TH STREET
EXTENSION
NE 100TH WAY
NE 99TH ST
NE 99TH ST
NE 97TH CIR
NE 96TH ST
NE 95TH ST
CLOSED LANDFILL
NE 94TH ST
NE 93RD PL
NE 92ND ST
NE 88TH ST
NE 90TH ST
KOSKI PROPERTY
NE 94TH AVE
NE 87TH ST
NE 86TH ST
NE 83RD ST
NE PADDEN PARKWAY
NE PADDEN PARKWAY

1 BACKGROUND AND PURPOSE

From 1935 until 1991, the Leichner landfill was Clark County's primary garbage disposal site. Most garbage was burned and the residue buried until 1962 when burning halted and all garbage was buried until changes in environmental regulations forced the closure of the landfill. The site is located at 9411 NE 94th Avenue in Clark County, Washington.

The county is completing due diligence and working with state agencies to purchase the landfill and adjacent properties, referred to in this report as the properties. The purchase includes the 74-acre landfill, the 35-acre Koski property to the south and west, and a couple of smaller properties. All but 4.8 acres are included in the county option that was part of an agreement signed in December 1988.

The due diligence being completed by the county before the sale closes on the approximately 120-acre purchase includes the development of alternatives for reusing the properties, along with a fatal flaw analysis of the alternatives. On November 17, 2011 county and City of Vancouver staff, along with other interested parties, met to decide the reuse alternatives for the properties and the criteria that would support this analysis. Participants identified reuse categories and evaluation criteria and directed county staff to refine them for further analysis.

The fatal flaw analysis conducted by BergerABAM will help guide the selection of alternatives for future reuse. This analysis is intended as a mid-level overview to identify fatal flaws as well as more workable alternatives worthy of further investigation. A more detailed review will be conducted as part of a future site master planning process. At the county's request, these alternatives are ranked by low, moderate, high, and very high risk for effective implementation. The higher the risk, the greater the likelihood that a particular reuse may be difficult or even impossible to implement. Reuses with multiple "very high" risk classifications may contain fatal flaws that will prevent implementation.

2 REUSES

2.1 Basis for This Analysis

Reuses considered as the basis for this analysis include:

- Economic development and job creation
  - Sell as surplus for private development
  - County partners with developers
  - County develops property
- Recreation
  - Sports field complex
  - Sports/entertainment center (facility)
  - Park (low impact)
- Energy generation
  - Solar
  - Waste energy – landfill recovery/reclamation
  - Biomass fuel facility
- Infrastructure/public facility
  - Public safety (such as a fire or police station)
  - Public utility (such as an electrical substation, wastewater pump station, or solid waste transfer station)
- Other
  - Single-family residential
  - Environmental improvement
  - Urban agriculture

2.2 Evaluation Categories

Participants in the November 2011 workshop also identified categories under which the relative risk and impacts of each potential reuse could be evaluated.

That larger list was subsequently consolidated to:

1 Zoning
2 Comprehensive plan compliance
3 Engineering
4 Community impact
5 Environmental impact
6 Fiscal implications for county
7 Regulatory barriers/opportunities

During our analysis, BergerABAM subsequently limited fiscal implications into a market analysis for redevelopment of the Koski property. Regulatory barriers/opportunities were melded into the zoning, comprehensive plan compliance, and environmental impacts categories to reduce duplication and focus the analysis more effectively.

To keep the costs of the fatal flaw analysis down, the county and BergerABAM agreed that no detailed engineering review would be conducted. They also agreed to limit fiscal implications to a general assessment of market forces affecting the potential for economic development and job creation at the Koski site. Preliminary engineering studies and more detailed fiscal analysis, such as return on investment (ROI) calculations, likely will become part of the master plan scope of work. Therefore, the best professional judgment of BergerABAM staff and basic research into site infrastructure needs underlie the engineering category and it is addressed with a brief narrative and table covering issues to consider. In addition, regulatory barriers/opportunities are included in the zoning, comprehensive plan, and environmental impact categories because barriers and opportunities are a natural subset of these categories.

2.3 Risk

BergerABAM evaluated the categories based on the risk involved, and defined risk as low, moderate, high, or very high. The overall intent of each rating is to project the likelihood that a particular reuse can be implemented effectively. The analysis rates the risk involved in each reuse option based on the category involved. For example, a particular reuse may be rated as low risk under the zoning category because it is a permitted use under the existing Light Industrial ML zone but, under the environmental/ regulatory category, the same reuse could be rated as high risk.

Risk Level Low – Presents minimal barriers to implementation.

Risk Level Moderate – Presents some—but manageable—barriers to implementation. Examples include the need to amend zoning and/or comprehensive plan designations or potential community resistance to a particular reuse.

Risk Level High – Presents significant barriers to implementation, May require complex and/or costly actions to make a reuse feasible. Examples include the necessity to protect the landfill cap when implementing certain uses, or uses that would require significant comprehensive plan revisions.

Risk Level Very High – Presents a high likelihood that barriers could prevent successful implementation. Examples would include great difficulty in obtaining environmental permits for a particular reuse or potentially intense community resistance to it.

2.4 Methodology

BergerABAM conducted literature and online research to locate relevant documents that addressed key questions. The same staff that prepared analyses for zoning, comprehensive plan, environmental impacts, and community impacts also interviewed selected county staff experts. Staff interviewed two private developers/brokers with expertise in Clark County for the industrial land development economic development reuse investigation.

The following analysis, except for engineering and fiscal implications, considers reuse for the landfill acreage alone, reuse for the Koski property alone, and then reuse that would involve

both properties combined. The evaluation conducted for the fiscal implications category discussed in section 5 considered only the economic development reuse, since assessing fiscal costs and returns for other categories would require more detailed information and analysis. The engineering analysis discussed in section 8 identifies activities that are likely to have high capital costs.

2.5 Property Scenarios

The entire site can be characterized as having two distinct areas that provide for a natural break in both physical conditions and any discussions on development impacts. Specifically, these characteristics are: a) areas encumbered by the landfill and its structural cap; and b) the area south of the landfill that is not encumbered by the landfill and cap. For the purposes of this analysis, these will be referred to as:

Leichner Landfill property – When this label, or the names "Leichner" or "landfill" are used, it is intended to refer to the approximately 80 acres of property characterized as having underlying landfill and that area that is covered by the landfill cap.

Koski Property – When this label or the name "Koski" is used, it is intended to refer to the parcels south of the landfill, approximately 35 acres in size, and predominantly represented by parcels #105740-000 and #199863-000.

Combined Scenario – As mentioned above, in addition to these two scenarios, the analysis often includes the possibility that the site could be developed as a whole. Therefore, when the analysis uses the term "combined", it is intended to refer to the use of both the landfill and the Koski properties. This must be kept in mind because often the combined analysis will focus not on the entire site but could instead focus on one particular aspect of either property that would significantly impact development under the combined scenario.

3 REVIEW CATEGORY: COMPREHENSIVE PLAN

3.1 Baseline Information

Both the Leichner landfill and Koski properties are designated "Light Industrial" by the Clark County Comprehensive Plan. According to the comprehensive plan, there are approximately 1,885 gross acres designated for industrial use throughout the county. According to the plan:

> *Areas within this designation provides for light manufacturing, warehousing, transportation and other land intensive uses. Services and uses which support industrial uses are allowed in these areas but are limited in size and location to serve workers within the light industrial area. Industrial lands are located in areas of compatible land uses and in areas with arterial access to the regional transportation network. Light Industrial implements this plan designation.*[1]

Industrial lands in Clark County are synonymous with employment lands and the comprehensive plan has policies that protect the employment land base. Policy 9.3.4 explains the criteria the county must consider before industrial lands may be converted to non-industrial or non-employment center districts. The items that apply to the Leichner and Koski properties are:

> *b. Protect employment lands from conversion to residential.*
>
> *c. Consider rezoning of employment lands to non-retail commercial, office campus, or business park if the proponent can show that (a) the zone change would accommodate unforeseen and rapidly changing commercial development needs, and (b) the proposed designation is more suitable than the current designation given the land's site-specific characteristics, and (c) the proposed zone change will generate jobs at a higher density than the current comprehensive plan zone allocation.*[2]

The items above express the county's desire to protect industrial property for jobs and allow changes to the industrial designation only when the change is in the best interest of jobs-generation in the county.

The comprehensive plan designation applied to these properties limits the zoning designations that may be applied to them. According to the table on page 1-11 of the comprehensive plan, the only zoning allowed in Light Industrial comprehensive plan designations is "light industrial" (ML). No other zoning districts are allowed in this comprehensive plan designation. Specifics related to uses allowed in the ML zoning district are in the Zoning section of this report.

3.2 Analysis

The tables below were generated as a result of comprehensive plan research and conversations with Community Planning Director Oliver Orjiako, Ph.D. BergerABAM first reviewed the comprehensive plan and checked those findings with Director Orjiako. The tables were amended to include his comments.

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[1] Clark County Comprehensive Plan Policy 9.3.4, pp. 1-14

[2] Clark County Comprehensive Plan Policy 9.3.4, pp. 9-10

Table 1. Comprehensive Plan Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	Economic development is encouraged as a use in the light industrial comprehensive plan designation. Selling the Leichner landfill property for private development is possible with this comprehensive plan designation. However, the purchaser would have to develop the property within the parameters of the Light Industrial designation or change the property's comprehensive plan designation.	Low	Selling the property would afford little risk to the county because it can be done consistently with the Comprehensive Plan designation now in place.
County Partners with Developers	Economic development is encouraged on Light Industrial properties. Partnering with developers would be consistent with the comprehensive plan, assuming the development would be industrial in nature. Commercial development of some types would require a comprehensive plan amendment and zoning change.	Low	The comprehensive plan encourages economic development in Light Industrial designations.
County Develops Property	Economic development is encouraged on Light Industrial properties. As long as the county developed the property consistent with the comprehensive plan designation of Light Industrial, development should be straightforward.	Low	The comprehensive plan encourages economic development in Light Industrial designations.
Recreation			
Sports Field Complex	Sports field complexes are not directly consistent with a Light Industrial comprehensive plan designation. The plan, however, does not prohibit these uses. The underlying zoning would determine if this use is allowed.	Moderate	Such a use is not directly consistent with the comprehensive plan; neither is it inconsistent. The comprehensive plan designation would not prohibit this activity, but the underlying zoning may.
Sports/Entertainment Center (Facility)	Sports/entertainment centers are not directly consistent with the Light Industrial comprehensive plan designation. The plan, however, does not prohibit such uses. The underlying zoning would determine if this use is allowed.	Moderate	Such a use is not directly consistent with the comprehensive plan; neither is it inconsistent. The comprehensive plan designation would not prohibit this activity, but the underlying zoning may.
Park (Low Impact)	A low impact park is inconsistent with the Light Industrial designation and the comprehensive plan because it would be a low-intensity land use in an area designated for high intensity uses.	High	Parks are inconsistent with the stated intent of the Light Industrial comprehensive plan designation. The property would require a change in comprehensive plan designation to allow such a use to occur on the property.

Table 1. Comprehensive Plan Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. The plan, however, encourages economic development. Solar energy, if sold back to the grid, could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on this property.
Waste Energy – Landfill Recovery/Reclamation	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. The plan, however, encourages economic development. If the energy is sold back to the grid, energy generation through landfill recovery and reclamation could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on this property.
Biomass Fuel Facility	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. If the energy is sold back to the grid, energy generation through a biomass incinerator could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on this property.
Infrastructure/Public Facility			
Public Safety	Public safety facilities are not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Low	Public safety facilities are generally permitted in most zones, and they are not expressly prohibited in the Light Industrial designation. Corrections facilities may not be consistent with the comprehensive plan due to their specific siting restrictions.

Table 1. Comprehensive Plan Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Public Utility	Public utilities are not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Low	The type of public utility proposed would determine if the use is allowed. The comprehensive plan is not specific about the siting of utilities within particular comprehensive plan designations. If the utility is serving a Light Industrial use, it is more consistent with the comprehensive plan. Zoning will determine how difficult it will be to site a public utility on the property.
Other			
Single-Family Residential	This use is inconsistent with the comprehensive plan designation for this property. The Light Industrial designation is for "light manufacturing, warehousing, transportation and other land intensive uses." Single-family development is inconsistent with this description.	High	This use is inconsistent with the comprehensive plan designation. The designation would need to change in order for single-family housing to occur on this property.
Environmental Improvement	This use is inconsistent with the comprehensive plan designation for this property. The Light Industrial designation is for "light manufacturing, warehousing, transportation and other land intensive uses." Environmental improvements, such as habitat restoration, would not be consistent with this zoning designation.	High	This use is inconsistent with the comprehensive plan designation. The designation would need to change in order for environmental improvements to occur on this property.
Urban Agriculture	Urban agriculture could be considered a "land intensive" use and would therefore be consistent with the comprehensive plan designation for this property.	Low	Urban agriculture is consistent with the comprehensive plan designation for this property.

Table 2. Comprehensive Plan Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	Economic development is encouraged as a use in the light industrial comprehensive plan designation. Selling the Koski property for private development is possible with this comprehensive plan designation. However, the purchaser would have to develop the property within the parameters of the Light Industrial designation or change the property's comprehensive plan designation.	Low	Selling the property would afford little risk to the county because it can be done consistently with the Comprehensive Plan designation now in place.
County Partners with Developers	Economic development is encouraged on Light Industrial properties. Partnering with developers would be consistent with the comprehensive plan, assuming the development would be industrial in nature. *Commercial development of some types would require a comprehensive plan amendment and zoning change.*	Low	The comprehensive plan encourages economic development in Light Industrial designations.
County Develops Property	Economic development is encouraged on Light Industrial properties. As long as the county developed the property consistent with the comprehensive plan designation of Light Industrial, development should be straightforward.	Low	The comprehensive plan encourages economic development in Light Industrial designations.
Recreation			
Sports Field Complex	Sports field complexes are not directly consistent with a Light Industrial comprehensive plan designation. Such uses, however, are not prohibited by the comprehensive plan. The underlying zoning would determine if this use is allowed.	Moderate	Such a use is not directly consistent with the comprehensive plan; neither is it inconsistent. The comprehensive plan designation would not prohibit this activity, but the underlying zoning may.
Sports/Entertainment Center (Facility)	Sports/entertainment centers are not directly consistent with the Light Industrial comprehensive plan designation. Such uses, however, are not prohibited by the comprehensive plan. The underlying zoning would determine if this use is allowed.	Moderate	Such a use is not directly consistent with the comprehensive plan; neither is it inconsistent. The comprehensive plan designation would not prohibit this activity, but the underlying zoning may.
Park (Low Impact)	A low impact park is inconsistent with the Light Industrial designation and the comprehensive plan because it would be a low-intensity land use in an area designated for high intensity uses.	High	Parks are inconsistent with the stated intent of the Light Industrial comprehensive plan designation. The property would require a change in comprehensive plan designation to allow such a use to occur on the property.

Table 2. Comprehensive Plan Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. The plan, however, encourages economic development. Solar energy, if sold back to the grid, could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on this property.
Waste Energy – Landfill Recovery/Reclamation	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. The plan, however, encourages economic development. If the energy is sold back to the grid, energy generation through landfill recovery and reclamation could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on this property.
Biomass Fuel Facility	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. If the energy is sold back to the grid, energy generation through a biomass incinerator could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on this property.
Infrastructure/Public Facility			
Public Safety	Public safety facilities are not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Low	Public safety facilities are generally permitted in most zones, and they are not expressly prohibited in the Light Industrial designation. Corrections facilities may not be consistent with the comprehensive plan due to their specific siting restrictions.

Table 2. Comprehensive Plan Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Public Utility	Public utilities are not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Low	The type of public utility proposed would determine if the use is allowed. The comprehensive plan is not specific about the siting of utilities within particular comprehensive plan designations. If the utility is serving a Light Industrial use, it is more consistent with the comprehensive plan. Zoning will determine how difficult it will be to site a public utility on the property.
Other			
Single-Family Residential	This use is inconsistent with the comprehensive plan designation for this property. The Light Industrial designation is for "light manufacturing, warehousing, transportation and other land intensive uses." Single-family development is inconsistent with this description.	High	This use is inconsistent with the comprehensive plan designation. The designation would need to change in order for single-family housing to occur on this property.
Environmental Improvement	This use is inconsistent with the comprehensive plan designation for this property. The Light Industrial designation is for "light manufacturing, warehousing, transportation and other land intensive uses." Environmental improvements, such as habitat restoration, would not be consistent with this zoning designation.	High	This use is inconsistent with the comprehensive plan designation. The designation would need to change in order for environmental improvements to occur on this property.
Urban Agriculture	Urban agriculture could be considered a "land intensive" use and would therefore be consistent with the comprehensive plan designation for this property.	Low	Urban agriculture is consistent with the comprehensive plan designation for this property.

Table 3. Comprehensive Plan Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	Economic development is encouraged as a use in the light industrial comprehensive plan designation. Selling the Leichner landfill and Koski properties for private development is possible with this comprehensive plan designation. However, the purchaser would have to develop them within the parameters of the Light Industrial designation or change their comprehensive plan designations.	Low	Selling the property would afford the county little risk because it can be done consistently with the Comprehensive Plan designation now in place.
County Partners with Developers	Economic development is encouraged on Light Industrial properties. Partnering with developers would be consistent with the comprehensive plan, assuming the development would be industrial in nature. Commercial development of some types would require a comprehensive plan amendment and zoning change.	Low	The comprehensive plan encourages economic development in Light Industrial designations.
County Develops Property	Economic development is encouraged on Light Industrial properties. As long as the county developed the property consistent with the comprehensive plan designation of Light Industrial, development should be straightforward.	Low	The comprehensive plan encourages economic development in Light Industrial designations.
Recreation			
Sports Field Complex	Sports field complexes are not directly consistent with a Light Industrial comprehensive plan designation. Such uses, however, are not prohibited by the comprehensive plan. The underlying zoning would determine if this use is allowed.	Moderate	Such a use is not directly consistent with the comprehensive plan; neither is it inconsistent. The comprehensive plan designation would not prohibit this activity, but he underlying zoning may.
Sports/Entertainment Center (Facility)	Sports/entertainment centers are not directly consistent with the Light Industrial comprehensive plan designation. Such uses, however, are not prohibited by the comprehensive plan. The underlying zoning would determine if this use is allowed.	Moderate	Such a use is not directly consistent with the comprehensive plan; neither is it inconsistent. The comprehensive plan designation would not prohibit this activity, but the underlying zoning may.
Park (Low Impact)	A low impact park is inconsistent with the Light Industrial designation and the comprehensive plan because it would be a low-intensity land use in an area designated for high intensity uses.	High	Parks are inconsistent with the stated intent of the Light Industrial comprehensive plan designation. The property would require a comprehensive plan designation to allow such a use to occur on the property.

Table 3. Comprehensive Plan Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. The plan, however, encourages economic development. Solar energy, if sold back to the grid, could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on these properties.
Waste Energy – Landfill Recovery/Reclamation	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. The plan, however, encourages economic development. If the energy is sold back to the grid, energy generation through landfill recovery and reclamation could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on these properties.
Biomass Fuel Facility	Energy generation is not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Moderate	The comprehensive plan is silent on siting energy-generation facilities of any type. If the energy is sold back to the grid, energy generation through a biomass incinerator could be considered an economic development opportunity. The zoning code would dictate the difficulty of siting such a facility on these properties.
Infrastructure/Public Facility			
Public Safety	Public safety facilities are not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Low	Public safety facilities are generally permitted in most zones and they are not expressly prohibited in the Light Industrial designation. Corrections facilities may not be consistent with the comprehensive plan due to their specific siting restrictions.

Table 3. Comprehensive Plan Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Public Utility	Public utilities are not expressly prohibited in the Light Industrial comprehensive plan designation. Zoning restrictions would determine if the comprehensive plan designation would need to be changed.	Low	The type of public utility proposed would determine if the use is allowed. The comprehensive plan is not specific about the siting of utilities within particular comprehensive plan designations. If the utility is serving a Light Industrial use, it is more consistent with the comprehensive plan. Zoning will determine how difficult it will be to site a public utility on these properties.
Other			
Single-Family Residential	This use is inconsistent with the comprehensive plan designation for these properties. The Light Industrial designation is for "light manufacturing, warehousing, transportation and other land intensive uses." Single-family development is inconsistent with this description.	High	This use is inconsistent with the comprehensive plan designation. The designation would need to change in order for single-family housing to occur on these properties.
Environmental Improvement	This use is inconsistent with the comprehensive plan designation for these properties. The Light Industrial designation is for "light manufacturing, warehousing, transportation and other land intensive uses." Environmental improvements, such as habitat restoration, would not be consistent with this zoning designation.	High	This use is inconsistent with the comprehensive plan designation. The designation would need to change in order for environmental improvements to occur on these properties.
Urban Agriculture	Urban agriculture could be considered a "land intensive" use and would therefore be consistent with the comprehensive plan designation for these properties.	Low	Urban agriculture is consistent with the comprehensive plan designation for these properties.

4 REVIEW CATEGORY: ZONING (TITLE 40)

4.1 Baseline Information

Both the Leichner landfill and Koski properties have a comprehensive plan designation of Light Industrial. Table 1.6 "Urban Plan Designation to Zone Consistency Chart" in the comprehensive plan shows that the only zone allowed within the Light Industrial comprehensive plan designation is ML.

Both the Leichner landfill and Koski properties are zoned Light Industrial (ML) consistent with the provisions of Clark County Code (CCC) 40.230.080 Industrial Districts (ML, MH, IR). According to CCC 40.230.080.A.1, the ML zone's stated purpose is as follows: "The light industrial district is intended to provide for those less-intensive industrial uses which produce little noise, odor and pollution. It also provides for resource-based uses and services that are deemed compatible with light industrial uses."

CCC 40.230.080 utilizes the North American Industrial Classification System (NAICS) as the framework to determine permitted uses within the Light Industrial zone. Table 40.230.080-1 shows uses that are permitted, permitted with conditions, and prohibited within the ML zone. The county is reviewing and revising this table. According to Dr. Oliver Orjiako, Clark County Community Planning Director, the revised table should be adopted into Title 40 in fall 2012.

For uses that are not allowed in the ML zone, the county would need to authorize a zoning and comprehensive plan designation amendment.

4.2 Analysis

The tables below were generated after reviewing CCC 40.230.080, specifically Table 40.230.080-1. These findings were confirmed with Dr. Orjiako and the tables reflect his comments.

Table 4. Zoning Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	Industrial economic development is expressly encouraged in the ML zone and selling this property for private development is consistent with that goal. The purchaser, however, would have to develop property within the parameters of the ML zoning or apply to change both comprehensive and zoning designations.	Low	Selling property would afford little risk to the county in terms of zoning consistency.
County Partners with Developers	Industrial economic development is expressly encouraged in the ML zone and partnering with developers to develop property is consistent with that goal. The partnership would however, have to develop within the parameters of ML zoning or apply to change comprehensive plan and zoning designations.	Low	CCC 40.230.080 encourages light industrial economic development in ML zones. Developing the site as part of a partnership will have low risk in terms of zoning consistency.
County Develops Property	Industrial economic development is expressly encouraged in the ML zone and developing property as such would be consistent with that goal. The county would however, have to develop within the parameters of the ML zoning designation or apply to change comprehensive plan and zoning designations.	Low	CCC 40.230.080 encourages light industrial economic development in ML zones. Developing the site will have low risk in terms of zoning consistency.
Recreation			
Sports Field Complex	Sports field complex may be considered a park (Table 40.230.080-1). These types of facilities are permitted in association with a permitted use.	Low	Assuming sports field complex is considered a park and would be developed associated with a permitted use, it could be consistent with ML zoning.
Sports/Entertainment Center (Facility)	Sports/entertainment center facility may be considered "fitness and recreational sports centers" (Table 40.230.080-1). These types of facilities are permitted, but footnote constrains amount of commercial and service uses to 10% of another industrial structure. A stand-alone facility would not be permitted within the ML zone.	High	This type of use can be incorporated as an accessory part of a larger project but cannot be permitted in the ML zone as a stand-alone structure. Developing such a facility would require comprehensive plan and zoning amendments.
Park (Low Impact)	Parks are permitted use in Table 40.230.080-1, but they must be developed in association with permitted use.	Low	Parks are permitted associated with permitted use. Assuming another permitted use is developed concurrently with a park, there should be little zoning-related difficulty with permitting this use.

Table 4. Zoning Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	All electrical power generation is prohibited within ML zone. Solar power generation is not specifically prohibited, but would be considered "other electric power generation" (Table 40.230.080-1).	High	Proposed use is prohibited within ML zone. For use to occur, county would first need to authorize comprehensive plan and zoning amendments.
Waste Energy – Landfill recovery/reclamation	While electric power generation is prohibited within ML zone, waste-to-energy facilities could be considered "solid waste combusters and incinerators" (Table 40.230.080-1). Solid waste combusters and incinerators are conditional use in ML zone and subject to provisions of CCC 40.260.200	Moderate	Assuming facility would be considered solid waste combustor and incinerator, use would be conditional and subject to provisions of CCC 40.260.200.
Biomass Fuel Facility	Since fuel must be transported to biomass facility, it would be considered energy generation facility and not an incinerator like landfill recovery/reclamation use described above and, therefore, is a prohibited use (Table 40.230.080-1).	High	Proposed use is prohibited within ML zone. For use to occur, county would first need to authorize comprehensive plan and zoning amendments.
Infrastructure/Public Facility			
Public Safety	Public buildings and police and fire substations are permitted within ML zone.	Low	Public safety facilities are permitted in the ML zone.
Public Utility	Sewer, water, and utility transmission and distribution lines and substations are permitted in ML zone. Electric power generation facilities are prohibited.	Low	Assuming public utility is limited to those types of uses permitted within ML zone, developing public utility facilities on this property should be minimally difficult.
Other			
Single-Family Residential	According to CCC 40.230.080.A, regulations therein "are intended to protect the industrial land base for industrial economic development and employment opportunities by limiting residential" and other non-industrial uses in this zone. While new single-family residential is not expressly prohibited in this zone, it is implied through the county allowing existing residential uses, without any increase in density.	High	Residential use is not consistent with the ML zone. For use to occur, county would first need to authorize comprehensive plan and zoning amendments.
Environmental Improvement	The most closely related use listed in Table 40.230.080-1 is "nature parks and other similar institutions." No uses related to restoration or other environmental improvements are listed in table. Nature parks prohibited within ML zone.	High	Use is prohibited within ML zone. For use to occur, county would first need to authorize comprehensive plan and zoning amendments.

Table 4. Zoning Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Urban Agriculture	Most closely related to "other vegetable (except potato) and melon farming" or "all other crop farming" in Table 40.230.080-1. Both are permitted in the ML zone.	Low	Use permitted in ML zone.

Table 5. Zoning Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as surplus for private development	Industrial economic development is expressly encouraged in ML zone and selling property for private development is consistent with that goal. The purchaser, however, would have to develop property within the parameters of the ML zoning designation or apply to change both the comprehensive plan and zoning designations.	Low	Selling property would afford little risk to the county in terms of zoning consistency.
County partners with developers	Industrial economic development is expressly encouraged in the ML zone and partnering with developers to develop this property is consistent with that goal. However, the partnership would have to develop the property within parameters of the ML zoning designation or apply to change both the comprehensive plan and zoning designations.	Low	CCC 40.230.080 encourages light industrial economic development in ML zones.
County develops property	Industrial economic development is expressly encouraged in the ML zone and developing property as such would be consistent with that goal. The county, however, would have to develop property within the parameters of the ML zoning designation or apply to change both the comprehensive plan and zoning designations.	Low	CCC 40.230.080 encourages light industrial economic development in ML zones.
Recreation			
Sports Field Complex	Sports field complex may be considered a park (Table 40.230.080-1). These types of facilities are permitted in association with a permitted use.	Low	Assuming sports field complex is considered a park, and would be developed associated with a permitted use, it could be consistent with ML zoning.
Sports/Entertainment Center (Facility)	Sports/entertainment center facility may be considered "fitness and recreational sports centers" (Table 40.230.080-1). These types of facilities are permitted, but footnote constrains amount of commercial and service uses to 10% of another industrial structure. A stand-alone facility would not be permitted within the ML zone.	High	This type of use can be incorporated as an accessory part of a larger project but cannot be permitted in the ML zone as stand-alone structure. Developing such a facility would require comprehensive plan and zoning amendments.
Park (Low Impact)	Parks are permitted use (Table 40.230.080-1) but must be developed in association with permitted use.	Low	Parks are permitted associated with permitted use. Assuming another permitted use is developed concurrently with park, there should be little zoning-related difficulty with permitting this use.

Table 5. Zoning Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	All electrical power generation prohibited within ML zone. Solar power generation not specifically prohibited, but would be considered "other electric power generation" (Table 40.230.080-1).	High	Proposed use prohibited within ML zone. For proposed use to occur, county would first need to authorize comprehensive plan and zoning amendments.
Waste Energy – Landfill recovery/reclamation	While electric power generation is prohibited within ML zone, waste-to-energy facilities could be considered "solid waste combusters and incinerators" (Table 40.230.080-1). Solid waste combusters and incinerators are conditional use in ML zone and subject to provisions of CCC 40.260.200.	Moderate	Assuming such a facility would be considered a solid waste combustor and incinerator, use would be conditional and subject to provisions of CCC 40.260.200.
Biomass Fuel Facility	Since fuel must be transported to biomass facility, it would be considered an energy generation facility and not an incinerator like the landfill recovery/reclamation use described above and therefore is a prohibited use (Table 40.230.080-1).	High	Proposed use prohibited within ML zone. For proposed use to occur, county would first need to authorize comprehensive plan and zoning amendments.
Infrastructure/Public Facility			
Public Safety	Public buildings and police and fire substations are permitted within ML zone.	Low	Public safety facilities permitted in ML zone.
Public Utility	Sewer, water, and utility transmission and distribution lines and substations are permitted in ML zone. Electric power generation facilities prohibited.	Low	Assuming public utility is limited to types of uses permitted within ML zone, developing public utility facilities on property should be minimally difficult.
Other			
Single-Family Residential	According to CCC 40.230.080.A, regulations "are intended to protect the industrial land base for industrial economic development and employment opportunities by limiting residential" and other non-industrial uses in this zone. While new single-family residential not expressly prohibited in this zone, it is implied through the county allowing existing residential uses, without any increase in density.	High	Residential use is not consistent with the ML zone. For proposed use to occur, county would first need to authorize comprehensive plan and zoning amendments.
Environmental Improvement	Most closely related use (Table 40.230.080-1) is "nature parks and other similar institutions." No uses related to restoration or other environmental improvements are listed in table. Nature parks prohibited within ML zone.	High	Proposed use prohibited within ML zone. For proposed use, county would first need to authorize comprehensive plan and zoning amendments.
Urban Agriculture	Most closely related to "other vegetable (except potato) and melon farming" or "all other crop farming" (Table 40.230.080-1). Both are permitted in the ML zone.	Low	Use permitted in ML zone.

Table 6. Zoning Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	Industrial economic development is expressly encouraged in the ML zone and selling this property for private development is consistent with that goal. The purchaser, however, would have to develop property within the parameters of the ML zoning or apply to change both comprehensive and zoning designations.	Low	Selling the property would afford the county little risk in terms of zoning consistency.
County Partners with Developers	Industrial economic development is expressly encouraged in the ML zone and partnering with developers to develop property is consistent with that goal. The partnership would however, have to develop within the parameters of ML zoning or apply to change comprehensive plan and zoning designations.	Low	CCC 40.230.080 encourages light industrial economic development in ML zones. Developing the site as part of a partnership will have low risk in terms of zoning consistency.
County Develops Property	Industrial economic development is expressly encouraged in the ML zone and developing property as such would be consistent with that goal. The county would however, have to develop within the parameters of the ML zoning designation or apply to change comprehensive plan and zoning designations.	Low	CCC 40.230.080 encourages light industrial economic development in ML zones. Developing the site will have low risk in terms of zoning consistency.
Recreation			
Sports Field Complex	Sports field complex may be considered a park (Table 40.230.080-1). These types of facilities are permitted in association with permitted use.	Low	Assuming sports field complex is considered a park, and would be developed associated with a permitted use, it could be consistent with ML zoning.
Sports/Entertainment Center (Facility)	Sports/entertainment center facility may be considered "fitness and recreational sports centers" (Table 40.230.080-1). These types of facilities are permitted, but footnote constrains amount of commercial and service uses to 10% of another industrial structure. A stand-alone facility would not be permitted within the ML zone.	High	This type of use can be incorporated as an accessory part of a larger project but cannot be permitted in the ML zone as a stand-alone structure. Developing such a facility would require comprehensive plan and zoning amendments.
Park (Low Impact)	Parks are permitted use in Table 40.230.080-1 but must be developed in association with permitted use.	Low	Parks are permitted associated with a permitted use. Assuming another permitted use is developed concurrently with a park, there should be little zoning-related difficulty with permitting this use.

Table 6. Zoning Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	All electrical power generation prohibited within ML zone. Solar power generation not specifically prohibited, but would be considered "other electric power generation" (Table 40.230.080-1).	High	Proposed use prohibited within ML zone. For proposed use, county would first need to authorize comprehensive plan and zoning amendments.
Waste Energy – Landfill recovery/reclamation	While electric power generation is prohibited within ML zone, waste-to-energy facilities could be considered "solid waste combusters and incinerators" (Table 40.230.080-1). Solid waste combusters and incinerators are conditional use in ML zone and subject to provisions of CCC 40.260.200	Moderate	Assuming such a facility would be considered a solid waste combustor and incinerator, use would be conditional and subject to provisions of CCC 40.260.200.
Biomass Fuel Facility	Since fuel must be transported to biomass facility, it would be considered an energy generation facility and not an incinerator like landfill recovery/reclamation use described above and therefore is a prohibited use (Table 40.230.080-1).	High	Proposed use prohibited within ML zone. For proposed use, county would first need to authorize comprehensive plan and zoning amendments.
Infrastructure/Public Facility			
Public Safety	Public buildings and police and fire substations permitted within ML zone.	Low	Public safety facilities permitted in ML zone.
Public Utility	Sewer, water, and utility transmission and distribution lines and substations permitted in ML zone. Electric power generation facilities prohibited.	Low	Assuming public utility is limited to types of uses permitted within ML zone, developing public utility facilities on properties should be minimally difficult.
Other			
Single-Family Residential	According to CCC 40.230.080.A, regulations "are intended to protect the industrial land base for industrial economic development and employment opportunities by limiting residential" and other non-industrial uses in this zone. While new single-family residential not expressly prohibited in this zone, it is implied through the county allowing existing residential uses, without any increase in density.	High	Residential use is not consistent with the ML zone. For proposed use, county would first need to authorize a comprehensive plan and zoning amendments.
Environmental Improvement	Most closely related use (Table 40.230.080-1) is "nature parks and other similar institutions." No uses related to restoration or other environmental improvements are listed in table. Nature parks prohibited within ML zone.	High	Proposed use prohibited within ML zone. For proposed use, county would first need to authorize comprehensive plan and zoning amendments.
Urban Agriculture	Most closely related to "other vegetable (except potato) and melon farming" or "all other crop farming" (Table 40.230.080-1). Both are permitted in the ML zone.	Low	Use permitted in ML zone.

5 REVIEW CATEGORY: FISCAL IMPLICATIONS

5.1 Baseline Information

Because of the known site development constraints of the former Leichner landfill site, this analysis of economic development opportunities and constraints is limited to the Koski property. The Koski property comprises four tax lot parcels totaling approximately 35 acres as identified below.

- Parcel 199845 – 2.12 acres
- Parcel 199864 – 0.16 acre
- Parcel 199863 – 7.42 acres
- Parcel 105740 – 25.49 acres

5.2 Analysis

To inform our analysis of economic development opportunities on the Koski property, we interviewed an industrial land developer very familiar with the Clark County market and an industrial land real estate broker who specializes in the marketing, leasing, and sale of industrial properties in the county. These interviews yielded some interesting facts regarding the general industrial land market in the county and the relative advantages to the Koski property. A summary of the comments received from these interviews is noted below.

- Most of the industrial development in Clark County is occurring at or around the Port of Vancouver, USA and very little new industrial construction is occurring in the outer areas of the county.
- Vacancy rates for existing multi-tenant industrial sites in Clark County are approximately 13%. Vacancies are trending downward, as this number was 15% at the end of the second quarter of 2011.
- Financial institutions are showing an unwillingness to finance speculative multi-tenant industrial development projects in the county.
- Industrial land near the new freeway interchange in Ridgefield represents the largest local competitor to industrial land development in the Padden Parkway corridor area. However, industrial development in the Ridgefield area has typically been by owner-occupants. The Padden corridor, because it is closer to the metro population center and the airport, is more likely to be a multi-tenant leased project.
- Industrial landowners have been reluctant to lower pricing, and current land prices make development difficult to pencil, particularly given the tightening of the financial market.
- The Koski site has locational advantages of close proximity to NE Padden Parkway and Interstate 205, and both interviewees thought the site had good potential for industrial development, with the aforementioned caveats.

For the purpose of this analysis, we have evaluated three primary development options for the Koski property. These are a) selling the land as surplus for private development; b) participating in a partnership to develop the property; and c) developing the property.

This analysis makes two fundamental assumptions regarding the property: 1) the property will remain planned and zoned for industrial development; and 2) a title conveyance stipulation of

"adequate and complete provision for the continued operation, maintenance, and monitoring of the Cleanup Action" can be adequately addressed by the property owner to allow the sale of the property. This title conveyance stipulation is included in Section 3 of the restrictive covenant on the property.

Each development option for the property is addressed in detail in the sections below.

5.2.1 Sell Land as Surplus for Private Development

One option that is available to the county, should it purchase the Koski site, is to sell the land as surplus for private development. This option is a relatively low risk proposition for the county, as it would allow the county to divest itself of the property and liquidate the asset, limiting the risks associated with investing in infrastructure and site development to make the sites "shovel ready."

Of course, with any acquisition and land sale, this option is not risk free. The primary risks are the holding time required to sell the property, any potential marketing costs, property maintenance costs, and liability insurance for the property while held, fencing and/or any other security provisions for the site, and the potential for lost value due to land pricing over the duration of the holding time.

Another risk, while potentially not a financial risk, is ensuring that the land buyer implements a development plan for the property that is consistent with the county's vision for the site and that will fulfill the promise of the property for industrial land and family wage employment that is desired. For this reason, it is recommended that the sale of the property occur through a competitive process with requirements for industrial development on the site stipulated in covenants, conditions, and restrictions on the title. This will help ensure that the asset is not simply a "land play" for the buyer and that the property is purchased with the intent to implement an industrial development consistent with the county's vision for the site and with the economic development goals and policies in the Clark County Comprehensive Plan. Because this development option requires little county financial and staff resource input and would limit the holding time of the property, we have categorized the risk level of this option as "low."

5.2.2 Participate in Partnership to Develop Property

Another option available to the county is to purchase the site and seek an industrial development partner to execute a development plan on the property. In such a case, the county may be able to help stimulate development on the property by offering the land value as participatory consideration in the development, thereby lowering the upfront capital costs of the third-party developer. In this arrangement, the county could participate in the development profits through an agreed-upon annual rate of return or other specified return on investment strategy. Such an agreement has a higher degree of potential to stimulate the development of the site and, with a carefully crafted development agreement, could allow the county to participate in the "upside" of the development profits while minimizing development risk.

County participation in a public-private partnership exposes the county to a higher degree of risk than simply selling the property outright. The county would have to spend resources for the creation of an RFP to solicit and secure a third-party developer and then would have to work with the developer to prepare a development program and partnership that meet the criteria of both parties. While the risks associated with site development could be limited

through thorough vetting of the development partner, careful drafting of the development agreement, and other safeguards, the county would potentially be at risk to contractor liens and other liabilities associated with non-performance of its development partner. There is also an element of political risk in that the project would be competing with other private developments in the vicinity, some of which offer property for lease. Overall, we would categorize the level of risk associated with this development option as "moderate."

5.2.3 County Develops Property

This development option assumes that the county, after purchasing the property, invests in the site infrastructure necessary to sell or lease industrial pads or buildings on the site. This option would require the county to allocate financial resources to design and construct the road, utility, and building infrastructure on the site.

Of the three options for the Koski site, this option represents the highest degree of risk to the county, likely for obvious reasons. It would require the county to tap in-house expertise or likely contract with a consultant with expertise in industrial development to manage the development process. It would also require the county to apply public capital to develop the necessary site infrastructure to develop the site and the county would bear the full liability risk associated with procuring contractor services and managing the land during the holding time of the project. Whether the project was sold to a third party upon completion or managed and leased, the county would be the sole investor in the project and bear the entire development risk.

Table 7. Fiscal Implications Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as surplus for private development	Minimizes holding time of property. Limits financial and staff resources that must be applied to managing property. Requires safeguards (CCRs) to ensure property is not resold by buyer and used for unintended (non-employment) purposes.	Low	Relatively low cost, limited holding time, and limited staff and financial resource input.
County partners with developers	Requires soliciting and obtaining a qualified and trusted development partner. Staff resources required to vet the development partner and ensure well-crafted development agreement. County cost input could be limited to land value. Financial risk shared with third-party developer. Competes against other private development in the vicinity.	Moderate	Higher degree of risk than selling land outright due to participation in land development, but financial downside and liabilities shared with third party with potential for compensation on "back end" of deal.
County develops property	County likely required to solicit and obtain industrial land developer to manage the development process. Financial inputs and all liabilities borne by county. Competes against other private development in vicinity.	High	County bears entire financial risk of development and must contend with political risk of competing with other private development in vicinity.
Recreation			
Sports Field Complex		N/A	
Sports/Entertainment Center (Facility)		N/A	
Park (Low Impact)		N/A	
Energy Generation			
Solar		N/A	
Waste Energy – Landfill recovery/reclamation		N/A	
Biomass Fuel Facility		N/A	
Infrastructure/Public Facility			
Public Safety		N/A	
Public Utility		N/A	

Table 7. Fiscal Implications Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Other			
Single-Family Residential		N/A	
Environmental Improvement		N/A	
Urban Agriculture		N/A	

6 REVIEW CATEGORY: ENVIRONMENTAL IMPACTS

The Leichner landfill site is closed under a consent decree with the Washington State Department of Ecology (Ecology). Cleanup at this site was implemented under the Model Toxics Control Act (MTCA) regulations of Chapter 173-340 of the Washington Administrative Code (WAC), and cleanup activities were completed under the Cleanup Action Plan Consent Decree No. 96-2-03081-7 between Ecology and Leichner Brothers Land Reclamation Corporation in 1996 (Ecology 2011). The cleanup actions were necessary to address soil and groundwater contamination resulting from the hazardous materials contained in a municipal solid waste landfill. Any redevelopment activities on the landfill itself must be coordinated with Ecology.

6.1 Methodology

A BergerABAM scientist visited the site on 27 February 2012 and viewed the Leichner landfill and the Koski property from a vehicle. BergerABAM scientists reviewed aerial photographs and online environmental literature to assess the potential presence of regulated resources. A thorough field visit should be completed at the sites before any development is planned.

Ecology and county representatives and the county's agent, BergerABAM, participated in a teleconference on 2 February 2012, and discussed potential concerns and questions regarding various development scenarios for the landfill and the adjacent Koski parcel (Ecology 2012). The environmental literature reviewed includes the Clark County GIS online mapping tool for natural resources, US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI), Washington Department of Fish and Wildlife (WDFW) Priority Habitat Species (PHS) online map, and Washington Department of Natural Resources (WDNR) Natural Heritage Program (NHP). The purpose of the site visit and resources review was to determine potential environmental constraints, such as the presence of wetlands, listed wildlife, and any issues that could arise from development on the site and impact groundwater contamination or result in additional impacts.

6.2 Baseline Information

6.2.1 Leichner Landfill

The Clark County GIS review shows a water feature mapped as a riparian habitat conservation area in the western section of landfill. The site visit concluded that the water feature appears to be one of three stormwater ponds constructed to collect and convey runoff from the surface of the landfill. According to county staff, no water feature existed at this location prior to the construction of the stormwater ponds. There are no USFWS NWI wetlands mapped on site, and the review of the WDFW PHS online map does not indicate the presence of sensitive or regulated natural resources on the parcel. Furthermore, the review of the WDNR NHP database does not show sensitive resources or high quality wetlands on site.

The Leichner parcel is mounded and, compared to the relatively flat surrounding residential areas, could be described as a hill. The mounded shape results from past landfill activities. Perennial and annual grasses comprise most of the vegetation on the site. The county removes Himalayan blackberry and noxious weeds from the site; because the landfill cap is located

approximately 3 feet below the surface, although this may vary across the site, and roots that penetrate deeper than 2 feet below surface could damage it, the county maintenance crew removes any trees or shrubs that become established on the site.

According to county staff, the Leichner parcel is used by coyotes, mice, voles, rabbits, hawks and owls, and songbirds. The stormwater ponds mentioned above support waterfowl use. During the site visit, no wildlife or plant species were observed on the site that are listed under the Endangered Species Act and regulated by the National Marine Fisheries Service and USFWS. The vegetation on the parcel is primarily grasses and is not suitable habitat for listed species that may occur elsewhere in the county.

The county monitors the site for methane gas emissions. Excess gas produced by the landfill is captured and burned on the site. In general, gas emissions for the site are low. From 2000 to 2009, landfill gas production decreased by about 89%. Any development on the site would need to ensure security and continued maintenance of these monitoring wells.

There are numerous groundwater monitoring wells on the site, and groundwater monitoring was conducted from 1987 through 2010. Volatile organic compounds (VOCs) have not been detected since the mid-1990s, and concentrations of most inorganics have been decreasing. However, groundwater monitoring must continue and the wells and their security must be maintained for the foreseeable future, as Ecology indicates no projected endpoint for monitoring activities. The landfill material is not likely to be considered inert quickly enough to minimize site restrictions and allow re-development in the short term.

According to Ecology, the stormwater runoff collected from the landfill is regulated under a National Pollutant Discharge Elimination System General Stormwater Permit (WAR-005572B). Stormwater is collected from the landfill and routed to three stormwater ponds for treatment via ditches. Two stormwater ponds are located at the north end, including a sedimentation pond that flows into a large stormwater pond. The third stormwater pond is located on the west side of the landfill, and stormwater from this pond is pumped to the north end. Following treatment, all stormwater from these ponds is pumped to Curtin Creek. A shallow aquifer and the deeper Troutdale aquifer underlie the parcel (Ecology 2012). The integrity of the landfill cap must be maintained to prevent the infiltration of precipitation through the landfill material and the consequent pollution of the groundwater and/or aquifer.

6.2.2 Koski Property

The review of the Clark County GIS online map, USFWS NWI, WDFW PHS, and WDNR NHP for the Koski property documented no sensitive or regulated natural resource areas on the parcel, and none was observed during the site visit. The Koski parcel is mostly flat; it is bounded by residential areas to the south and west, industrial land to the north, and the Leichner landfill to the north and east. Based on observations during the site visit, the habitat type is similar to the Leichner landfill, with vegetation primarily comprising perennial and annual grasses. Trees at the south portion of the parcel surround the location of the old farmhouse, but there are no trees or shrubs on the remainder of the parcel. Suitable habitat to support federal listed plants that may occur in Clark County is not present, and none of these plants was observed during the site visit. Like the Leichner property, the Koski parcel is likely used by typical urban wildlife such as coyotes, mice, voles, rabbits, hawks and owls, and

various songbirds. Several monitoring wells are located at the eastern edge of the Koski parcel abutting the landfill. There is no cap underlying the Koski parcel.

6.3 Analysis

6.3.1 Leichner Landfill

Any re-development activities on the Leichner parcel must maintain the integrity of the cap and the stormwater management system to protect the shallow alluvial aquifer and the deeper Troutdale sole source aquifer and must allow the continued maintenance and security of the monitoring wells on the Leichner and Koski properties and along the residential properties.

Any development proposals would have to coordinate the security of the landfill and monitoring locations with Ecology, and the level of protection (e.g., restricted hours of public access, fencing of specific areas, signage) that will be required would be part of the approval process with Ecology.

Ground vibrations from re-development could potentially cause gas to migrate to the edge of the capped landfill, near other properties. Pile installation (i.e., for deep foundations) on the Leichner parcel would penetrate and compromise the cap and could lead to uncontrolled gas emission and the pollution of groundwater and/or the aquifer through precipitation. Although the mapped water feature appears to be a stormwater pond with no wetland characteristics, it should be assessed more fully and determined not to be wetland before any development occurs.

The conversion of landfill to waste energy production by burning landfill material would require uncapping the landfill. It is important to note that the suitability of the current composition of landfill materials for waste energy production is unknown, and this would need to be determined.

Any piles that are constructed for deep foundations or shallow footing foundations that penetrate the cap would require a way of re-sealing the cap at the impact sites. Engineering design for these structures would be costly. Sports development of the site would require adding clean fill to portions of the landfill to accommodate more passive development uses such as parks, ball fields, running trails, etc., and some of these options may be more easily approved by Ecology if the impermeable landfill cap and monitoring wells are maintained. Maintaining security would require burying the above-ground pipes for the monitoring wells.

Table 8. Environmental Impact Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	Site preparation activities such as grading could impact the cap. Placement of additional fill could result in settlement of the landfill and damage to the cap. Any development activity that could penetrate the cap (e.g., pile installation and/or construction of foundations) would need to provide designs to re-seal the cap at impacted sites and maintain stormwater management. The parcel is used by urban wildlife. Economic development would transform much of the site and will likely reduce available grass seed and reduce/alter the suite of wildlife species the site supports. Security of the landfill and access to monitoring well locations must be maintained; any development proposal must be coordinated with Ecology.	Very High	Integrity of the cap must be maintained to continue preventing infiltration of precipitation through landfill material and into groundwater. Impacts to wildlife use of the site. Re-development requires coordination with Ecology.
County Partners with Developers	Site preparation activities such as grading could impact the cap. Placement of additional fill could result in settlement of the landfill and damage to the cap. Any development activity that could penetrate the cap (e.g., pile installation and/or construction of foundations) would need to provide designs to re-seal the cap at impacted sites and maintain stormwater management. The parcel is used by urban wildlife. Economic development would transform much of the site and will likely reduce available grass seed and reduce/alter the suite of wildlife species the site supports. Security of the landfill and access to monitoring well locations must be maintained; any development proposal must be coordinated with Ecology.	Very High	Integrity of the cap must be maintained to continue preventing infiltration of precipitation through landfill material and into groundwater. Impacts to wildlife use of the site. Re-development requires coordination with Ecology.
County Develops Property	Site preparation activities such as grading could impact the cap. Placement of additional fill could result in settlement of the landfill and damage to the cap. Any development activity that could penetrate the cap (e.g., pile installation and/or construction of foundations) would need to provide designs to re-seal the cap at impacted sites and maintain stormwater management. The parcel is used by urban wildlife. Economic development would transform much of the site and will likely reduce available grass seed and reduce/alter the suite of wildlife species the site supports. Security of the landfill and access to monitoring well locations must be maintained; any development proposal must be coordinated with Ecology.	Very High	Integrity of the cap must be maintained to continue preventing infiltration of precipitation through landfill material and into groundwater. Impacts to wildlife use of the site. Re-development requires coordination with Ecology.

Table 8. Environmental Impact Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Recreation			
Sports Field Complex	Site preparation activities such as grading to create a flat site and installation of lighting could impact the cap. The site requires slope to maintain stormwater drainage to collection ponds. Above-ground pipes would need to be buried for protection. The parcel can be used by coyotes, mice, voles, rabbits, waterfowl in storm ponds, hawks and owls, and songbirds. Converting the site is likely to reduce available grass seed and could reduce/alter the suite of wildlife species the site supports.	Moderate to High	High impacts possible to the cap and stormwater system. Integrity of the cap must be maintained to continue preventing infiltration of precipitation through landfill material and into groundwater. Impacts to wildlife use of the site. Locations of monitoring wells must be maintained.
Sports/Entertainment Center (Facility)	Site preparation activities such as grading and installation of lighting could impact the cap. Development entailing foundation construction and/or pile installation is likely to impact the cap and require engineering designs to re-seal the cap at impact sites while maintaining stormwater integrity. The parcel can be used by coyotes, mice, voles, rabbits, waterfowl in storm ponds, hawks and owls, and songbirds. Converting the site is likely to reduce available grass seed and could reduce/alter the suite of wildlife species the site supports.	Very High	High impacts possible to the cap and stormwater system. Integrity of the cap must be maintained. High impacts anticipated on wildlife that use the site.
Park (Low Impact)	Low impact park development that does not include construction of foundations or structures could likely have low impacts on the landfill. Above-ground pipes would need to be located below ground to protect them. Regular presence of people on site may impact wildlife that use it, but wildlife likely using the site are already acclimated to urban areas. Security of monitoring wells would need to be maintained.	Low	Low levels of impacts are anticipated to wildlife; long-term benefits could occur if the site is kept as low impact park. Low levels of impacts would be anticipated to the stormwater system and cap. Security of monitoring wells must be ensured and maintained.
Energy Generation			
Solar	Construction of solar panels could impact the cap. Installation of solar panels could impact wildlife. Avian wildlife that preys on mice and voles may be deterred by solar panels.	Moderate to High	Construction of solar panels could impact the cap. Low/moderate impact can be anticipated on urban wildlife that use the site.
Waste Energy – Landfill Recovery/Reclamation	Uncapping the landfill could create a new contaminant that would require additional mitigation. Stormwater collection system maintenance would be impacted. Air quality could be an issue given adjacent residential development. Burning waste in an incinerator would trigger Environmental Protection Agency (EPA) involvement and a permit from the Southwest Clean Air Agency (SWCAA). Landfill reclamation would impact wildlife that use site.	Very High	Potential impact to air quality. Uncapping the landfill could introduce new contaminants; steps needed to protect groundwater and ensure stormwater treatment. Landfill reclamation would trigger EPA regulatory involvement.

Table 8. Environmental Impact Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Biomass Fuel Facility	Landfill cap could be compromised by construction. Air quality could be an issue given adjacent residential development. Burning biomass would trigger an SWCAA permit. A biomass plant would affect wildlife. A biomass plant would impact stormwater runoff.	Very High	Potential impact to cap integrity and air quality. SWCAA permitting constraints. Potential stormwater management challenges.
Infrastructure/Public Facility			
Public Safety	Construction of a public safety facility could penetrate the cap for foundations, impact monitoring wells, and affect the current stormwater system.	Very High	Integrity of the cap must be maintained to continue preventing infiltration of precipitation through the landfill material and into groundwater. Locations of monitoring wells need to be maintained.
Public Utility	Construction of public utility could penetrate the cap, impact monitoring wells, and affect the current stormwater system.	Very High	Integrity of the cap must be maintained to continue preventing infiltration of precipitation through the landfill material and into groundwater. Locations of monitoring wells need to be maintained.
Other			
Single-Family Residential	Single-family residential development would require grading and fill, and foundations could increase settling of the landfill and impact the cap.	High	Residential development could result in accelerated settling and affect the cap.
Environmental Improvement	Environmental improvements such as habitat restoration could involve planting trees, shrubs, and groundcover. Habitat restoration may require use of irrigation. Additional water on site would need to be factored into the capacity of the stormwater system.	Moderate	Tree roots could affect the cap; groundcover species with shallow root systems could be installed. Potential impacts of an irrigation system would need to be considered and managed.
Urban Agriculture	Urban agriculture could entail grading to create a level planting area; additional soil amendments and additional weight could result in settlement of the landfill. If soil is added, integrity of the cap needs to be maintained. If irrigation is used, additional water would need to be factored into stormwater system.	Low to Moderate	Urban agriculture and associated site preparation activities could result in landfill settlement. Potential impacts of an irrigation system would need to be considered and managed.

6.3.2 Koski Property

The development potential of the Koski parcel is significantly less constrained than on the adjacent landfill parcel despite the existence of monitoring wells in the eastern portion of the parcel. The security and maintenance of those wells (and for the adjacent landfill) will have to be ensured under any development proposal. This will likely be a major factor in any Ecology review and approval process.

Among the significantly less concerning considerations is the installation of piles for structures and foundations on the Koski property, which normally would not be anticipated to impact the integrity of the landfill cap.

The construction of a landfill to waste energy plant on the Koski parcel, however, would require significant agency coordination and permits. The use of materials from the landfill for energy production would require uncapping the adjacent landfill. The composition and suitability of landfill materials from the site for waste energy production is unknown. There is also additional risk from uncapping the landfill which could open a new and direct opportunity for contaminant introduction (requiring additional mitigation).

Air quality concerns from the operation of a waste incinerator given its location in a residential area would be an issue. Gas emissions from this activity would require coordination, air discharge modeling, and a permit from SWCAA. EPA involvement would be expected in any land use proposal for waste energy production through incineration.

The site is used by urban wildlife, but no listed plants or wildlife or suitable habitat for these species were observed on the site. Few natural environment effects are anticipated by development of the parcel because of the marginal value provided by the site.

Table 9. Environmental Impact Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	Any development would need to ensure security and maintenance of the monitoring wells. The parcel is used by coyotes, mice, voles, rabbits, hawks, owls, and songbirds. Developing the parcel would reduce available habitat and likely reduce/alter the suite of wildlife species that depend on this site No listed species anticipated on site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
County Partners with Developers	Any development would need to ensure security and maintenance of the monitoring wells. The parcel is used by coyotes, mice, voles, rabbits, hawks, owls, and songbirds. Developing the parcel would reduce available habitat and likely reduce/alter the suite of wildlife species that depend on this site No listed species anticipated on site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
County Develops Property	Any development would need to ensure security and maintenance of the monitoring wells. The parcel is used by coyotes, mice, voles, rabbits, hawks, owls, and songbirds. Developing the parcel would reduce available habitat and likely reduce/alter the suite of wildlife species that depend on this site No listed species anticipated on site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
Recreation			
Sports Field Complex	Constructing a sports field complex would require grading, field maintenance, and result in an increased human presence which would impact the urban wildlife that currently use site. No regulated natural resources were observed on site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
Sports/Entertainment Center (Facility)	The parcel is used by coyotes, mice, voles, rabbits, hawks, owls, and songbirds. Constructing a sports facility could reduce available habitat and likely reduce/alter the suite of urban wildlife species that depend on this site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
Park (Low Impact)	Park improvements and the increased presence of people would likely result in some impact to wildlife that use site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.

Table 9. Environmental Impact Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	The parcel is used by coyotes, mice, voles, rabbits, hawks, owls, and songbirds. Construction would reduce available habitat and likely reduce/alter suite of wildlife species that depend on this site, but some of site would likely still be used by wildlife.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
Waste Energy – Landfill Recovery/Reclamation	If integrity of adjacent cap is compromised for the purpose of obtaining fuel, the property is likely to be impacted by contamination. Landfill reclamation would require close coordination with Ecology. Monitoring wells need to be maintained. The parcel is used by coyotes, mice, voles, rabbits, hawks, owls, and songbirds. Landfill reclamation would likely result in impacts to wildlife that use it.	Very High	Landfill reclamation on the adjacent Leichner parcel could result in new contaminant that would require mitigation. Uncapping the landfill could impact groundwater. Landfill reclamation would require coordination with Ecology.
Biomass Fuel Facility	If integrity of the landfill cap is compromised, the Koski property and groundwater could be impacted. Construction of a biomass facility could impact air quality in vicinity. Construction of a biomass plant would entail EPA involvement and an SWCAA air permit as well as coordination with Ecology. Monitoring wells need to be maintained. Parcel use by coyotes, mice, voles, rabbits, hawks, owls, and songbirds would likely be affected by use of the site for a biomass facility.	High	Construction of an incinerator and burning biomass will trigger SWCAA permitting and potential EPA involvement. Proximity to landfill creates a risk to the cap and can potentially disrupt the ongoing groundwater monitoring.
Infrastructure/Public Facility			
Public Safety	Construction would need to ensure maintenance and security of monitoring wells. Development of the parcel would result in some impacts to urban wildlife that uses the site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
Public Utility	Construction would need to ensure maintenance and security of monitoring wells. Development of the parcel would result in some impacts to urban wildlife that uses the site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.

Table 9. Environmental Impact Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Other			
Single-Family Residential	Construction would need to ensure maintenance and security of the monitoring wells, and require coordination with Ecology. Development of the parcel would result in some impacts to the urban wildlife that uses the site.	Low	No regulated or sensitive natural resources were observed on site. Development impact risks are low with continued security and maintenance of monitoring wells and by avoiding the landfill.
Environmental Improvement	Environmental improvements to the site would need to ensure maintenance and security for the monitoring wells. Would require coordination with Ecology. Environmental improvements would benefit urban wildlife.	Low	Environmental improvements could provide wildlife benefit but would need to ensure continued safety and maintenance of monitoring wells.
Urban Agriculture	Urban agriculture on site would need to accommodate maintenance and ensure the security of monitoring wells. This use would require coordination with Ecology. Urban agriculture could alter the suite of urban wildlife that use the site.	Low	Urban agriculture would need to ensure maintenance and security for monitoring wells. Wildlife effects deemed low.

6.3.3 Leichner Landfill/Koski Property Combined

Development activities using the combined Leichner landfill/Koski properties would cause significant limitations for environmental and permitting constraints similar to those for the Leichner landfill property by itself. Any development would need to maintain the integrity of the cap and continued stormwater management for the landfill. This includes protecting the shallow alluvial aquifer and the deeper Troutdale sole source aquifer, as well as allowing the continued maintenance and ensuring the security of the monitoring wells. However, it could result in an easier accomplishment of these responsibilities because it allows one responsible entity to perform the work.

The conversion of the landfill to waste energy production by burning landfill material would require uncapping the landfill and well as the construction of an energy generation burning facility (most likely on the Koski property). The construction of a landfill to a waste energy plant would require significant Ecology, EPA, and SWCAA agency coordination and permits.

Landfill reclamation by any method would also require uncapping the landfill and close agency coordination.

Under the single large project option, site design will affect environmental issues because the project could be organized to address those specific concerns which surround the landfill. The design of any structures with foundations could penetrate the cap and an engineering method would need to be designed and implemented to re-seal it, or be located on the portion of the project site without the underlying cap. Even temporary impacts to the cap could result in the contamination of groundwater.

Leveling the landfill for development would require adding clean fill to portions of the landfill to accommodate even passive development uses such as parks, ball fields, running trails, etc. This added fill could result in landfill settling but these uses may be more favorably viewed for approval by Ecology if the impermeable landfill cap and monitoring wells are maintained.

The above-ground pipes for the monitoring wells would need to be buried to maintain security.

Table 10. Environmental Impact Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development	The constraints of Table 8 represent the larger environmental risks and considerations for any kind of joint Leichner Landfill/Koski property project, with the following considerations: Using the entire acreage could allow having one single entity with authority. Designs for development could use the strengths of each property to make a better project. Development opportunities could be greater as a single project. Environmental impacts could be better avoided, minimized, and mitigated as a single project.	Very High	In spite of these benefits, the underlying landfill issues still apply. Integrity of the cap must be maintained to continue preventing infiltration of precipitation through landfill material and into groundwater. Impacts to wildlife use of the site. Re-development requires coordination with Ecology.
County Partners with Developers	The constraints of Table 8 represent the larger environmental risks and considerations for any kind of joint Leichner Landfill/Koski Property project, with the following considerations: Using the entire acreage could allow having one single partnership with authority. Designs for development could use the strengths of each property to make a better project. Development opportunities could be greater as a single project. Environmental impacts could be better avoided, minimized, and mitigated as a single project.	Very High	In spite of these benefits, the underlying landfill issues still apply. Integrity of the cap must be maintained to continue preventing infiltration of precipitation through landfill material and into groundwater. Impacts to wildlife use of the site. Re-development requires coordination with Ecology.
County Develops Property	The constraints of Table 8 represent the larger environmental risks and considerations for any kind of joint Leichner landfill/Koski property project, with the following considerations: Using the entire acreage could allow having one single entity with authority. Designs for development could use the strengths of each property to make a better project. Development opportunities could be greater as a single project. Environmental impacts could be better avoided, minimized, and mitigated as a single project.	Very High	In spite of these benefits, the underlying landfill issues still apply. Integrity of the cap must be maintained to continue preventing infiltration of precipitation through landfill material and into groundwater. Impacts to wildlife use of the site. Re-development requires coordination with Ecology.
Recreation (see tables 8 and 9)			
Sports Field Complex		Moderate	
Sports/Entertainment Center (Facility)		Very High	
Park (Low Impact)		Low	

Table 10. Environmental Impact Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation (see tables 8 and 9)			
Solar		High	
Waste Energy – Landfill Recovery/Reclamation		Very High	
Biomass Fuel Facility		High	
Infrastructure/Public Facility (see tables 8 and 9)			
Public Safety		Very High	
Public Utility		Very High	
Other (see tables 8 and 9)			
Single-Family Residential		Very High	
Environmental Improvement		Moderate	
Urban Agriculture		Moderate	

7 REVIEW CATEGORY: COMMUNITY IMPACT

7.1 Baseline Information

The 120-acre site, comprising both the landfill and the Koski property, is an island zoned Light Industrial (ML) surrounded by single-family residential (R1) with densities going as high as 12 units per acre. In community terms, this is a fairly high-density residential area with most of the newer homes situated on small lots. The northern and western boundaries of the Leichner property do not have residences bordering the property line. The eastern and southern boundaries abut directly onto residential back or side yards. In most cases, fences, bushes, and trees are the only barriers separating the residents from the Leichner property.

The site is within the county's Sunnyside Neighborhood Association, which is inactive, according to the Clark County Public Information Office.

The Vancouver School District operates two elementary schools within a few blocks of the property. Sunset Elementary is to the west at 9011 NE 95th Street and Silver Star Elementary is to the southeast at 10500 NE 86th Street.

The community impacts category is intended to apply a qualitative assessment of anticipated community responses to various future use scenarios. These conclusions are based on the best professional judgment of experienced community relations professionals since this analysis does not include, nor should it, any direct communication with residents in the area. Jim Gladson and John D. White, BergerABAM, made these assessments. Both have spent more than 30 years working with communities on complex and controversial projects. John has spent most of his career working with Clark County communities, and Jim has provided community outreach and involvement in the county since 2005. A more quantitative community impact assessment will likely be part of a future master planning process.

7.2 Analysis

7.2.1 Leichner Landfill Only

The landfill was closed and subsequently capped in 1991. Although not accessible for public use, this 74-acre site has served as a visual open space for surrounding residences since completion of the capping process. Many current residents may have no memory of the landfill in operation. Converting existing open space within dense residential areas to more active uses can meet community resistance, even if that use is a community or neighborhood park.

The assumption guiding this analysis is that the more disruptive and intense the land use activity, the more likely it is to generate community resistance. The table below merges some potential reuses because their community impact would be effectively the same. The community impact risks noted in the following table focus entirely on how nearby residents may react to certain reuses. Thus, a use with low risk from environmental and land use perspectives may still be moderate to high risk regarding community acceptance. The analysis focusing only on the landfill segment of the property assumes higher risk levels because of potential to disturb the cap and generate public concerns about air and groundwater contamination and potential odors.

Table 11. Community Impact Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development County Partners with Developers County Develops Property	If development generated by any of these approaches stays within the parameters of the Light Industrial (ML) zone, then community reaction would likely be more focused on those issues typically associated with new development. Those can be characterized by increased traffic volume, vehicular cross-circulation, noise, odor, stormwater runoff, water quality, aesthetics, hours of operation, outside storage, and lighting. Landfill environmental concerns could also be raised depending upon use and design considerations.	Moderate	Relatively low impact light industrial development could be acceptable to nearby residents with proper traffic, noise, and operational requirements in place. This risk rating also assumes avoiding disruption of existing landfill cap or engineering the development project to maintain cap integrity.
Recreation			
Sports Field Complex	Recent experience with ball field development in Hazel Dell and previously in Hockinson indicates that nearby residents will be concerned with noise, loss of privacy, lighting for night games, and traffic. Again, disrupting the cap would increase community concerns significantly.	Moderate	Experience with community response to previous ball field development indicates that concerns and issues can be mitigated effectively. This risk rating assumes minimal impact to the cap.
Sports/Entertainment Center (Facility)	Community impact would be directly related to scale. A neighborhood or community recreation facility would likely generate less concern than a high-volume regional complex with large special weekend and evening events that would tend to attract large crowds. Noise, traffic, lights, and loss of privacy for nearby homes would likely be the primary issues. Again, development affecting the cap would generate concerns about environment, odor, and contamination.	Moderate	A moderate risk assumes no disruption of the cap and the associated issues it could raise. All other likely impacts could be mitigated. High-volume entertainment centers, however, would likely be a high risk (but not infeasible).
Park (Low Impact)	Development as a public park featuring trails, play structures, and open space would likely attract a modest level of community concern simply because more people would be brought to site. Based on our experience with other parks developments, nearby neighbors will be concerned about noise, loss of privacy, and potential for inappropriate/illegal activities seen in other more remote park areas. Orchard Highlands Community Park, about 5 blocks east of site, already features low impact uses such as trails. A small, neighborhood park to the west is shared with Sunset Elementary School. This assumes no significant impact to the cap that could generate community concerns.	Low	Two parks are nearby; one is playground-oriented and other provides a trail system. There may be community support for a park. Potential resistance will come from immediate neighbors, but concerns could be mitigated.

Table 11. Community Impact Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	The major issue for nearby residents will likely be the visual impacts of solar panels atop the landfill. Scale of development will also affect community response. Infrastructure improvements to manage power transmission (such as sub-stations and/or power lines) could increase community impacts.	Moderate	This risk level assumes some level of mitigated visual impact without significant additional infrastructure such as a substation, power lines, and 24-hour operational lighting or activity. The more extensive the development, the higher the impact and related risk level.
Waste Energy – Landfill Recovery/Reclamation Biomass Fuel Facility	Based on recent community reaction to proposed biomass heating facility in downtown Vancouver, there is likely to be significant community resistance to operating any sort of "smokestack" plant adjacent to residences and within proximity of two elementary schools. Whether real or perceived, there will be strong concerns about impact on air quality. If the facility includes landfill reclamation, then community concerns will be heightened by potential for odors, contamination, and excessive noise.	Very High	Real or perceived concerns will include air quality, loss of property values, odors, noise, contamination, and impacts on children both at home and in nearby schools. The ability to mitigate these concerns to a level of community acceptance would be unlikely.
Infrastructure/Public Facility			
Public Safety	Public acceptance of a police or fire station would be high given the improved sense of public safety provided. Concerns would focus on noise, lights close to residences, and impact to landfill cap that might increase odors or the threat of contamination. We have not analyzed proximity of existing police or fire services and response times. A master planning process may find these potential uses redundant or infeasible.	Moderate	Public acceptance is based on an assumption that residents would welcome improved public safety. Concerns about noise, light, and 24-hour activity can be mitigated.
Public Utility	Public acceptance will be directly related to the type and size of facility. A large power sub-station with related noise and power line infrastructure could encounter resistance. Other facilities, such as a wastewater pump station or solid waste transfer station, face resistance because of real or perceived issues regarding odor, noise, and impacts on property values.	High	This risk level assumes an activity that will have visual as well as operational impacts on surrounding neighbors. This types of uses historically generate community concerns, but can be mitigated.

Table 11. Community Impact Risk Analysis of Leichner Landfill Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Other			
Single-Family Residential	From community impact perspective only, development on landfill and/or Koski property would fill open space in an already-dense residential area. Changes to road infrastructure and increased traffic volumes also typical issues. Attracting buyers to homes developed on a landfill could be problematic. Also, 74 acres of residential land at a density of approximately 12 units per acre would increase the available supply of lots/houses by up to 888 units.	High	An already densely populated residential area will not respond positively to loss of open space for additional residential units. Buyers would avoid buying homes built on a landfill. An additional surge of new housing stock could affect prices.
Environmental Improvement	If these improvements can be designed as visual amenities as well as environmental benefits, then community acceptance should be high. The only concerns could be related to mosquito attraction to standing water.	Low	Residents will likely accept visual improvements to existing open space that also provide demonstrated environmental benefits.
Urban Agriculture	Based on review of Google Earth aerials, some agricultural fields remain east of the site. Community reaction would be based on scale of development, with community gardens or low-intensity truck farms being the most acceptable. More intensive agriculture activities including herbicide application, noise, and odors would likely not be welcomed.	Moderate	Some level of low-intensity agriculture could gain community acceptance. The more intense the use, the higher the risk and the greater the need for mitigation.

7.2.2 Koski Property Only

Development of any sort focused entirely on the Koski property would have similar community impacts as development on the landfill. The notable exception would be reduced public concern about environmental and health impacts if the landfill were undisturbed under these development scenarios.

Table 12. Community Impact Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Economic Development			
Sell as Surplus for Private Development County Partners with Developers County Develops Property	If development generated by any of these approaches stays within the parameters of the Light Industrial (ML) zone, then community reaction would likely be more focused on those issues typically associated with new development. Those can be characterized by increased traffic volume, vehicular cross-circulation, noise, odor, stormwater runoff, water quality, aesthetics, hours of operation, outside storage, and lighting. Confining development to the Koski property would likely reduce public concerns about impact to the landfill cap.	Moderate	Relatively low impact light industrial development could be acceptable to nearby residents with proper traffic, noise, and operational requirements in place. This risk rating also assumes avoiding disruption of existing landfill cap
Recreation			
Sports Field Complex	Recent experience with ball field development in Hazel Dell and previously in Hockinson indicates that nearby residents will be concerned with noise, loss of privacy, lighting for night games, and traffic.	Moderate	Experience with community response to previous ball field development indicates that concerns and issues can be mitigated effectively. This risk rating assumes minimal impact on the landfill cap.
Sports/Entertainment Center (Facility)	Community impact would be directly related to scale. A neighborhood or community recreation facility would likely generate less concern than a high-volume regional complex with large special weekend and evening events that would tend to attract large crowds. Noise, traffic, lights, and loss of privacy for nearby homes would likely be the primary issues. Again, development affecting the cap would generate concerns about environment, odor, and contamination.	Moderate	We assign a moderate risk that assumes no community perception of risk associated with cap disruption. All other likely impacts could be mitigated. High-volume entertainment center, however, would likely be high risk (but not infeasible).
Park (Low Impact)	Development as a public park featuring trails, play structures, and open space would likely attract a modest level of community concern simply because more people would be brought to site. Based on our experience with other parks developments, nearby neighbors will be concerned about noise, loss of privacy, and potential for inappropriate/illegal activities seen in other more remote park areas. Orchard Highlands Community Park, about 5 blocks east of site, already features low impact uses such as trails. A small, neighborhood park to the west is shared with Sunset Elementary School.	Low	Two parks are nearby; one is playground-oriented and the other provides a trail system. There may be community support for a park. Potential resistance will come from immediate neighbors, but concerns could be mitigated.

Table 12. Community Impact Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Energy Generation			
Solar	The major issue for nearby residents will likely be the visual impacts of solar panels atop the landfill. Scale of development will also affect community response. Infrastructure improvements to manage power transmission (such as sub-stations and/or power lines) could increase community impacts.	Moderate	This risk level assumes some level of mitigated visual impact without significant additional infrastructure such as substation, power lines, and 24-hour operational lighting or activity. The more extensive the development, the higher the impact and related risk level.
Waste Energy – Landfill Recovery/Reclamation Biomass Fuel Facility	Based on recent community reaction to proposed biomass heating facility in downtown Vancouver, there is likely to be significant community resistance to operating any sort of "smokestack" plant adjacent to residences and within proximity to two elementary schools. Whether real or perceived, there will be strong concerns about impact on air quality as well as noise and truck traffic.	Very High	Real or perceived concerns will include air quality, loss of property values, odors, noise, contamination, and impacts on children both at home and in nearby schools. The ability to mitigate these concerns to a level of community acceptance would be unlikely.
Infrastructure/Public Facility			
Public Safety	Public acceptance of a police or fire station would be high given the improved sense of public safety provided. Concerns would focus on noise, lights close to residences, and impact to landfill cap that might increase odors or the threat of contamination. We have not analyzed proximity of existing police or fire services and response times. A master planning process may find these potential uses redundant or infeasible.	Low	Public acceptance is based on an assumption that residents would welcome improved public safety. Concerns about noise, light, and 24-hour activity can be mitigated. Since landfill is not affected, these public concerns would not be a significant issue.
Public Utility	Public acceptance will be directly related to type and size of facility. A large power sub-station with related noise and power line infrastructure could encounter resistance. Other facilities, such as a wastewater pump station or solid waste transfer station, face resistance because of real or perceived issues regarding odor, noise, and impacts on property values.	High	This risk level assumes an activity that will have visual as well as operational impacts on surrounding neighbors. This types of uses historically generate community concerns, but can be mitigated.
Other			
Single-Family Residential	From community impact perspective only, development on landfill and/or Koski property would fill open space in an already-dense residential area. Changes to road infrastructure and increased traffic volumes also typical issues. Also, 35 acres of residential land at a density of approximately 12 units per acre would increase the available supply of lots/houses by up to 420 units.	High	An already densely populated residential area will not respond positively to loss of open space for additional residential units. An additional surge of new housing stock could affect prices.
Environmental Improvement	If these improvements can be designed as visual amenities as well as environmental benefits, then community acceptance should be high. The only concerns could be related to mosquito attraction to standing water.	Low	Residents will likely accept visual improvements to existing open space that also provide demonstrated environmental benefits.

Table 12. Community Impact Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rationale
Urban Agriculture	Based on review of Google Earth aerials, some agricultural fields remain east of the site. Community reaction would be based on scale of development, with community gardens or low-intensity truck farms being the most acceptable. More intensive agriculture activities including herbicide application, noise, and odors would likely not be welcomed.	Moderate	Some level of low-intensity agriculture could gain community acceptance. The more intense the use, the higher the risk and the greater the need for mitigation.

7.2.3 Combined

Table 13, with minor additions, reflects the same level of community impacts and concerns as those identified in the landfill only analysis. This reflects the potential community concerns regarding breaching the existing landfill cap and/or opening the landfill for reclamation as part of the waste to energy alternative.

Table 13. Community Impact Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rational
Economic Development			
Sell as Surplus for Private Development County Partners with Developers County Develops Property	If development generated by any of these approaches stays within the parameters of the Light Industrial (ML) zone, then community reaction would likely be more focused on those issues typically associated with new development. Those can be characterized by increased traffic volume, vehicular cross-circulation, noise, odor, stormwater runoff, water quality, aesthetics, hours of operation, outside storage, and lighting. Landfill environmental concerns could also be raised depending upon use and design considerations.	Moderate	Relatively low impact light industrial development could be acceptable to nearby residents with proper traffic, noise, and operational requirements in place. This risk rating also assumes avoiding disruption of existing landfill cap or engineering the development project to maintain cap integrity.
Recreation			
Sports Field Complex	Recent experience with ball field development in Hazel Dell and previously in Hockinson indicates that nearby residents will be concerned with noise, loss of privacy, lighting for night games, and traffic. Again, disrupting the cap would increase community concerns significantly.	Moderate	Experience with community response to previous ball field development indicates that concerns and issues can be mitigated effectively. This risk rating assumes minimal impact to the landfill cap.
Sports/Entertainment Center (Facility)	Community impact would be directly related to scale. A neighborhood or community recreation facility would likely generate less concern than a high-volume regional complex with large special weekend and evening events that would tend to attract large crowds. Noise, traffic, lights, and loss of privacy for nearby homes would likely be the primary issues. Again, development affecting the cap would generate concerns about environment, odor, and contamination.	Moderate	A moderate risk assumes no disruption of the cap and the associated issues that could raised. All other likely impacts could be mitigated. High-volume entertainment centers, however, would likely be a high risk (but not infeasible).
Park (Low Impact)	Development as a public park featuring trails, play structures, and open space would likely attract a modest level of community concern simply because more people would be brought to site. Based on our experience with other parks developments, nearby neighbors will be concerned about noise, loss of privacy, and potential for inappropriate/illegal activities seen in other more remote park areas. Orchard Highlands Community Park, about 5 blocks east of site, already features low impact uses such as trails. A small, neighborhood park to the west is shared with Sunset Elementary School. This assumes no significant impact to the landfill cap that could generate community concerns.	Low	Two parks are nearby; one is playground-oriented and other provides a trail system. There may be community support for a park. Potential resistance will come from immediate neighbors, but concerns could be mitigated.

Table 13. Community Impact Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rational
Energy Generation			
Solar	The major issue for nearby residents will likely be the visual impacts of solar panels atop the landfill. Scale of development will also affect community response. Infrastructure improvements to manage power transmission (such as sub-stations and/or power lines) could increase community impacts.	Moderate	This risk level assumes some level of mitigated visual impact without significant additional infrastructure such as a substation, power lines, and 24-hour operational lighting or activity. The more extensive the development, the higher the impact and related risk level.
Waste Energy – Landfill Recovery/Reclamation Biomass Fuel Facility	Based on recent community reaction to proposed biomass heating facility in downtown Vancouver, there is likely to be significant community resistance to operating any sort of "smokestack" plant adjacent to residences and within proximity to two elementary schools. Whether real or perceived, there will be strong concerns about impact on air quality. If the facility includes landfill reclamation, then community concerns will be heightened by potential for odors, contamination, and excessive noise.	Very High	Real or perceived concerns will include air quality, loss of property values, odors, noise, contamination, and impacts on children both at home and in nearby schools. The ability to mitigate these concerns to a level of community acceptance would be unlikely.
Infrastructure/Public Facility			
Public Safety	Public acceptance will be directly related to the type and size of facility. A large power sub-station with related noise and power line infrastructure could encounter resistance. Other facilities, such as a wastewater pump station or treatment facility, face greater resistance because of real or perceived issues regarding odor, noise, and impacts on property values.	Moderate	Public acceptance based on assumption that residents would welcome improved public safety. Concerns about noise, light, and 24-hour activity can be mitigated.
Public Utility	Public acceptance will be directly related to type and size of facility. A large power sub-station with related noise and power line infrastructure could encounter resistance. Other facilities, such as a wastewater pump station or treatment facility, face resistance because of real or perceived issues regarding odor, noise, and impacts on property values.	High	This risk level assumes an activity that will have visual as well as operational impacts on surrounding neighbors. This types of uses historically generate community concerns, but can be mitigated..
Other			
Single-Family Residential	From community impact perspective only, development on landfill and/or Koski property would fill open space in an already-dense residential area. Changes to road infrastructure and increased traffic volumes also typical issues. Attracting buyers to homes developed on a landfill could be problematic. Also, 110 acres of residential land at a density of approximately 12 units per acre would increase the available supply of lots/houses by up to 1,320 units.	High	An already densely populated residential area will not respond positively to loss of open space for additional residential units. Buyers would avoid buying homes built on a landfill. An additional surge of new housing stock could affect prices.
Environmental Improvement	If these improvements can be designed as visual amenities as well as environmental benefits, then community acceptance should be high. The only concerns could be related to mosquito attraction to standing water.	Low	Residents will likely accept visual improvements to existing open space that also provide demonstrated environmental benefits.

Table 13. Community Impact Risk Analysis of Combined Properties

Reuse Alternatives	Factors/Issues Considered	Risk	Rational
Urban Agriculture	Based on review of Google Earth aerials, some agricultural fields remain east of the site. Community reaction would be based on scale of development, with community gardens or low-intensity truck farms being the most acceptable. More intensive agriculture activities including herbicide application, noise, and odors would likely not be welcomed. Any activity that threatened or was perceived to threaten the landfill cap would meet community resistance.	Moderate	Some level of low-intensity agriculture could gain community acceptance. The more intense the use, the higher the risk and the greater the need for mitigation.

8 REVIEW CATEGORY: ENGINEERING

8.1 Baseline Information

As noted in the introduction, this analysis does not provide a detailed engineering assessment for potential reuses. It is intended as a high-level preliminary assessment to identify likely engineering and infrastructure factors, which upon their face appear to be fatal flaws which would likely prevent the reuse category or specific idea from ever being realized. This report further presumes that additional preliminary engineering analysis will be included in a future master planning process.

This analysis is based on the potential engineering difficulties and costs to achieve the desire reuse or reuse category. These findings are provided as best professional judgment from a Professional Engineer at BergerABAM.

8.2 Analysis

The residential and light industrial properties surrounding the Leichner property have both water and sewer services available. This analysis assumes that any development within the property would require connection to existing water and sewer services. This analysis also presumes that the current sewer and water services are sized to meet primarily residential demands. Depending on water demands and/or discharge levels, there could be the potential need to upsize existing, off-site infrastructure to handle increased demands from commercial and/or industrial facilities.

Facilities to manage stormwater discharges on site could also pose significant challenges depending on the level of new, impervious surfaces created by future redevelopment.

This analysis finds that the existing transportation infrastructure may well lack capacity to serve higher volume traffic and/or heavy vehicle loads. NE 94th Avenue is the main access road to the property from the Padden Parkway. This two-lane, unimproved, minor arterial would likely require an upgrade to accommodate higher traffic volumes. There are minimal access points to the Leichner property itself, and all other roads in the immediate area are for residential use.

This analysis considers the separate use of the landfill and Koski properties in Table 14 and Table 15.

Table 14. Engineering Risk Analysis of Leichner Landfill Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rational
Economic Development			
Sell as Surplus for Private Development	This option would require minimal engineering if surplused "as is."	Low	Limited costs for infrastructure additions or improvements
County Partners with Developers	Development of this site will likely require landfill reclamation as well as sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, and structural design may also be required.	Very High	Assumes that costs will be shared by the county and developer.
County Develops Property	Development of this site will likely require landfill removal as well as sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, and structural design may also be required.	Very High	Assumes that the county will bear the entire cost for upgrading infrastructure to a level that will attract leases
Recreation			
Sports Field Complex	Development of this site will require both sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, lighting, and structural design may also be required. Any activity that may affect the landfill cap will need extensive engineering analysis.	High	County would likely incur most of the cost for infrastructure upgrades and design of fields and buildings. This risk assignment assumes increased costs to achieve engineering solutions that protect cap integrity.
Sports/Entertainment Center (Facility)	Development of this site could require landfill reclamation or extensive engineering to protect the landfill cap. This is in addition to sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, and structural design may also be required.	Very high	County would likely share costs with a private developer for infrastructure upgrades and design of fields and buildings. Significant landfill development will increase costs considerably to achieve engineering solutions that protect cap integrity.
Park (Low Impact)	Engineering needs would focus on providing water connections for irrigation, grading plans, and design engineering for excavations that may affect the landfill cap. This assumes there would be no lighting, parking, or restrooms/structures.	Low	Engineering would require minimal infrastructure improvements, basic park design, and engineering to avoid impacts to the landfill cap.
Energy Generation			
Solar	Development will definitely require some level of road improvement. Largest engineering costs would include design of the solar field and connecting above- and below-ground infrastructure. There will be significant engineering challenges to avoid impacts to the landfill cap.	Moderate	Assumes minimal impact to the landfill cap, and high level of engineering for installation and operation of solar panels.

Table 14. Engineering Risk Analysis of Leichner Landfill Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rational
Waste Energy – Landfill Recovery/Reclamation	This reuse would require a very high level of engineering to design a workable reclamation plan for the landfill. In addition, highly specialized engineering would be required to design the energy facility and related water, sewer, and electrical grid infrastructure	Very High	From an engineering perspective, this would be the most challenging reuse among all of those considered here.
Biomass Fuel Facility	This reuse would require a very high level of specialized engineering to design the incinerator facility and related sewer, water and transportation infrastructure to manage delivery of multiple daily loads of biomass fuel. Location on the landfill would require extensive engineering to protect the cap or to remove the landfill entirely.	Very High	This requires a high level of specific engineering expertise for design of the incinerator and electrical grid infrastructure. Landfill protection or removal also poses costly engineering challenges.
Infrastructure/Public Facility			
Public Safety	Locating a structure on the landfill would require significant engineering to protect the cap and provide infrastructure services. Removing the landfill to accommodate the new structure would create additional engineering challenges	Very High	Location on the landfill poses extensive engineering challenges
Public Utility	These sorts of facilities required special engineering expertise. Protecting or removing the landfill will require extensive engineering.	Very High	Design of public utilities such as sub-stations, pump stations, and treatment facilities require specialized engineering in addition to providing for necessary basic infrastructure needs. Protection or removal of the landfill poses additional challenges
Other			
Single-Family Residential	Likely county engineering expenses would be related to engineering review of designs submitted by a developer for infrastructure services.	Low	No direct engineering costs to the county.
Environmental Improvement	Engineering focus on stormwater facility excavation, grading, and planting designs. Minimal demand for infrastructure improvements beyond hookups to existing water and sewer. Presumes no impact on the landfill cap.	Low	Much lower engineering demand, which likely can be handled by the county in house.
Urban Agriculture	Engineering focus on water service hookup and irrigation system design. Minimal road improvements required. Assumes no impact on the landfill cap	Low	Much lower engineering demand, which likely can be handled by the county in house.

Table 15. Engineering Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rational
Economic Development			
Sell as Surplus for Private Development	This option would require minimal engineering if surplused "as is."	Low	Limited costs for infrastructure additions or improvements
County Partners with Developers	Development of this site will require sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, and structural design may also be required.	Moderate	Assumes that costs will be shared by the county and developer.
County Develops Property	Development of this site will sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, and structural design may also be required.	High	Assumes that the county will bear the entire cost for upgrading infrastructure to a level that will attract leases
Recreation			
Sports Field Complex	Development of this site will require both sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, lighting, and structural design may also be required. Any activity that may affect the landfill cap will need extensive engineering analysis.	Moderate	This would require moderate infrastructure upgrades and design of fields and buildings. Minimal engineering required for landfill protection
Sports/Entertainment Center (Facility)	Development of this site will sewer and water connections at minimum, with additional costs for road improvements. Survey, geotechnical, stormwater, and structural design may also be required.	Moderate	Engineering would focus on infrastructure upgrades and design of fields and buildings. Minimal engineering required for landfill protection
Park (Low Impact)	Engineering needs would focus on providing water connections for irrigation, grading plans, and design engineering for excavations. This assumes there would be no lighting	Low	Engineering would require minimal infrastructure improvements, basic park design, and engineering to avoid impacts to the landfill cap.
Energy Generation			
Solar	Largest engineering costs would include design of the solar field and connective above- and below-ground infrastructure.	Moderate	Assumes minimal impact to the landfill cap, and high level of engineering for installation and operation of solar panels.
Waste Energy – Landfill Recovery/Reclamation	This reuse would require a very high level of engineering to design a workable reclamation plan for the landfill. In addition, highly specialized engineering would be required to design the energy facility and related water, sewer, and electrical grid infrastructure to be located on the Koski property.	Very High	From an engineering perspective, this would be the most challenging reuse among all of those considered here.

Table 15. Engineering Risk Analysis of Koski Property Only

Reuse Alternatives	Factors/Issues Considered	Risk	Rational
Biomass Fuel Facility	This reuse would require a very high level of specialized engineering to design the incinerator facility and related sewer, water, electrical and transportation infrastructure to manage delivery of multiple daily loads of biomass fuel. Location adjacent to the landfill would require engineering to protect cap integrity and maintain groundwater monitoring.	High	This requires a high level of specific engineering expertise for design of the incinerator and electrical grid infrastructure. Landfill and monitoring well protection could require additional engineering
Infrastructure/Public Facility			
Public Safety	This would require a fairly routine level of engineering for infrastructure and structural design.	Low	This risk rating assumes the facility is located entirely on the Koski property and has no direct impact on the landfill. Standard structural engineering requirements.
Public Utility	Facilities such as power sub-stations, pump stations and solid waste transfer stations can require a high level of infrastructure such as underground utilities services and overhead transmission lines. These types of facilities may require special engineering expertise.	Moderate	Engineering public utilities is a widely practiced service. This property could be developed for such uses with utility infrastructure and modest transportation improvements.
Other			
Single-Family Residential	Likely county engineering expenses would be related to engineering review of designs submitted by a developer for infrastructure services.	Low	No direct engineering costs to the county.
Environmental Improvement	Engineering focus on stormwater facility excavation, grading, and planting designs. Minimal demand for infrastructure improvements beyond hookups to existing water and sewer. Presumes no impact on the landfill cap.	Low	Much lower engineering demand, which likely can be handled by the county in house.
Urban Agriculture	Engineering focus on water service hookup and irrigation system design. Minimal road improvements required. Assumes no impact on the landfill cap.	Low	Much lower engineering demand, which likely can be handled by the county in house.

9 CONCLUSIONS

9.1 Overview

This analysis carried each reuse alternative through a screening process using specific evaluation categories. These categories formed the basis for assigning levels of risk that could then be used to assign a level of difficulty for implementing a particular reuse. Each reuse alternative was evaluated in isolation for each category. The intent of this approach is to allow decision-makers to then view the full range of findings and identify by category where the greatest implementation challenges may lie for each reuse.

For example, the comprehensive plan analysis did not consider other categories such as environmental, engineering, or community impacts in assigning risk. Rather, the analysis evaluated if the comprehensive plan itself, when considered in isolation, contained barriers to implementation, and to what level those barriers might be considered significant. In this context, a designation of low risk would apply to reuses which comply with the intent of the current comprehensive plan for uses at the site. A reuse that required amendments to the current plan in order to meet Growth Management Act compliance guidelines would present a higher risk. Relating risk to the challenges of effecting the zone changes that would be necessary to accommodate a particular reuse also applies to the zoning category.

Comprehensive plan and zoning compliance, and to some extent community impacts, are what we consider process categories. Implementation could require some level of legislative and/or community involvement action to accomplish a desired outcome. The level of assigned risk therefore flows from our findings of how difficult these processes might be, and whether barriers to implementation are surmountable.

On the other hand, the environmental and engineering evaluation categories focus much more on physical impacts to the environment and/or human health, and the ability to engineer effective solutions to manipulating that environment. In these categories, risk is assigned based on the regulatory and physical challenges presented to implementing a reuse that can attain the necessary environmental compliance permissions and/or be constructible.

For example, a reuse for an approved light industrial activity on the landfill portion of the properties may be low risk from the comprehensive plan and zoning perspectives, but much higher risk for regulatory approval if that reuse threatens the integrity of the current landfill cleanup and monitoring operations administered by Ecology.

9.2 Findings

A review of the detailed analysis tables will show clearly that potential reuses that involve disturbance of the landfill cap and related cleanup infrastructures increases risk and reveals potential fatal flaws. Conversely, the Koski portion of the property offers much more opportunity and flexibility for a variety of reuses. At the county's request, this analysis reviewed reuses on the landfill and Koski properties individually and combined. Again, reuses that included the landfill tended to have elevated risks, creating barriers to successful implementation.

9.2.1 Landfill Risks

The comprehensive plan and the zoning designations for the landfill portion of the Leichner property identify this parcel as available for light industrial development. The reality, however, is that this portion of the property is under an Ecology consent order to manage methane gas recovery from the site and monitor for groundwater contamination. In our discussion with Ecology representatives, the agency did not identify any short- or long-term plan to consider no further action at the site. Any potential reuse would need to meet Ecology's environmental management and protection requirements. Some potential reuses could trigger additional permitting requirements through the EPA. Our conclusion is that any use of the capped landfill property for other than low impact recreation or environmental enhancement would equate to high or very high risk and pose potential fatal flaws.

9.2.2 Koski Property Risks

As noted above, the Koski acreage offers much greater development potential when the property is used as a stand-alone parcel and is not combined with the landfill acreage as an integrated development package. Barriers to development are moderate and in compliance with current comprehensive plan and zoning designations, regulatory constraints to high intensity uses such as energy production, and community impacts associated with uses not compatible with surrounding residential properties. Our mid-level analysis did show some potential for light industrial development and job creation as the economy recovers. The site also offers space for recreation, location of public safety services such as a fire station, and low intensity urban agriculture.

9.2.3 Potential Fatal Flaws

Several reuses had a mix of high and very high risk within the various evaluation categories. The energy generation alternatives for waste to energy and biomass energy production stand out as the highest risk reuses in multiple categories. We conclude that significant barriers such as regulatory permitting and community impacts could prevent implementation of these energy reuses and constitute fatal flaws. Although an in-depth cost analysis was not included in this effort, it is also reasonable to assume that engineering and operation costs would likely exceed benefits, at least in the near term.

If the county determines that energy production is a desired use at the site, our analysis shows that construction of a solar facility on either Koski, the landfill, or both may be feasible. Our analysis did not include a technical evaluation of whether this location is actually suitable for optimum solar collection and energy distribution.

Error! Reference source not found. shows color-coded rankings for each reuse measured against the evaluation categories. The frequent occurrence of very high (in red) risk can be used as a basic measure for which reuses would likely face barriers that could prevent implementation.

Table 16. Fatal Flaw Analysis of Potential Reuses – Landfill Property Only

	Economic Development			Recreation			Energy Generation			Infrastructure		Other/Miscellaneous		
	Surplus	Partners	Develops	Sports Fields	Entertainment	Park	Solar	Waste to Energy	Biomass	Safety	Utility	Residential	Environmental	Urban Ag
Comp Plan														
Zoning														
Financial														
Environmental														
Community														
Engineering														

Table 17. Fatal Flaw Analysis of Potential Reuses – Koski Property Only

	Economic Development			Recreation			Energy Generation			Infrastructure		Other/Miscellaneous		
	Surplus	Partners	Develops	Sports Fields	Entertainment	Park	Solar	Waste to Energy	Biomass	Safety	Utility	Residential	Environmental	Urban Ag
Comp Plan														
Zoning														
Financial														
Environmental														
Community														
Engineering														

KEY
Low
Moderate
High
Very High

Table 18. Fatal Flaw Analysis of Potential Reuses – Combined Scenario

	Economic Development			Recreation			Energy Generation			Infrastructure		Other/Miscellaneous		
	Surplus	Partners	Develops	Sports Fields	Entertainment	Park	Solar	Waste to Energy	Biomass	Safety	Utility	Residential	Environmental	Urban Ag
Comp Plan														
Landfill	Low	Low	Low	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Low	High	High	Low
Koski	Low	Low	Low	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Low	High	High	Low
Combined	Low	Low	Low	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Low	High	High	Low
Zoning														
Landfill	Low	Low	Low	Low	High	Low	High	Moderate	High	Low	Low	High	High	Low
Koski	Low	Low	Low	Low	High	Low	High	Moderate	High	Low	Low	High	High	Low
Combined	Low	Low	Low	Low	High	Low	High	Moderate	High	Low	Low	High	High	Low
Financial														
Landfill														
Koski	Low	Moderate	High											
Combined														
Environmental														
Landfill	Very High	Very High	Very High	Moderate	Very High	Low	Moderate	Very High	Very High	Very High	Very High	High	Moderate	Low
Koski	Low	Low	Low	Low	Low	Low	Low	Very High	High	Low	Low	Low	Low	Low
Combined	Very High	Very High	Very High	Moderate	Very High	Low	High	Very High	High	Very High	Very High	Very High	Moderate	Moderate
Community														
Landfill	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Very High	Very High	Moderate	High	High	Low	Moderate
Koski	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Very High	Very High	Low	High	High	Low	Moderate
Combined	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Very High	Very High	Moderate	High	High	Low	Moderate
Engineering														
Landfill	Low	Very High	Very High	High	Very High	Low	Moderate	Very High	Very High	Very High	Very High	Low	Low	Low
Koski	Low	Moderate	High	Moderate	Moderate	Low	Moderate	Very High	High	Low	Moderate	Low	Low	Low
Combined	Low	Moderate	High	Moderate	Moderate	Low	Moderate	Very High	Very High	Low	Moderate	Low	Low	Low

KEY
Low
Moderate
High
Very High

10 LITERATURE CITED

Washington State Department of Ecology (Ecology). 2012. Teleconference with County staff (Travis Goddard and Mike Davis), Ecology (Rebecca Lawson, James DeMay, and Mohsen Kourehdar), and BergerABAM (Jim Gladson and Ed Strohmaier) regarding environmental impacts/constraints on potential development scenarios. February 2, 2012.

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