

# Memo



Date: July 20, 2011  
To: City Manager  
From: Land Use Management, Community Sustainability (JM)  
Application: OCP11-0010, Z11-0037      Owner: City of Kelowna  
Address: 1595 Glenmore Road N (portion of)      Applicant: City of Kelowna (M. Watt)  
Subject: OCP Amendment & Rezoning Application for New Landfill Entrance  
Existing OCP Designation: Public Service Utilities (PSU) & Resource Protection Area (AGR)  
Proposed OCP Designation: Public Service Utilities (PSU)  
Existing Zone: Agriculture 1 - A1  
Proposed Zone: Utilities - P4

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## 1.0 Recommendation

THAT OCP Amendment Application No. OCP11-0010 to amend Map 4.1 of the Kelowna 2030 - Official Community Plan Bylaw No. 10500, by changing the Future Land Use designation of part of Lot A, Sections 9, 10, 15, 16, Township 23, Plan KAP85071, ODYD, located at 1595 Glenmore Road North, Kelowna, BC, from the Resource Protection Area (AGR) designation, to the Public Service Utilities (PSU) designation, as shown on Map "A" attached to the report of Land Use Management Department dated July 20, 2011, be considered by Council;

AND THAT Council considers the APC public process to be appropriate consultation for the purpose of Section 879 of the *Local Government Act*, as outlined in the Report of the Land Use Management Department dated July 20, 2011.

AND THAT Rezoning Application No. Z11-0037 to amend the City of Kelowna Zoning Bylaw No. 8000, by changing the zoning classification of part of Lot A, Sections 9, 10, 15, 16, Township 23, Plan KAP85071, ODYD, located at 1595 Glenmore Road North, Kelowna, BC, from the Agriculture 1 zone (A1) to the Utilities zone (P4) as shown on Map "B" attached to the report of the Land Use Management Department, dated July 20, 2011, be considered by Council;

AND THAT Zone Amending Bylaw be forwarded to a Public Hearing for further consideration;

AND FURTHER THAT final adoption of Zone Amending Bylaw be considered in conjunction with Council's consideration of a Development Permit on the subject property;

A handwritten signature in black ink, appearing to be the initials "JW".

AND THAT final adoption of Zone Amending Bylaw be considered subsequent to the requirements of the Development Engineering Branch and the Glenmore-Ellison Improvement District being completed to their satisfaction.

## 2.0 Purpose

The City of Kelowna is proposing to construct new entrance and associated infrastructure for the Glenmore Landfill to replace the existing entrance, which is poorly located and which has inadequate infrastructure. The new facilities are proposed to be situated on land located at the southeast corner of the landfill site and which are presently zoned A1 and designated Public Service Utilities (PSU). The subject lands are also situated within the Agricultural Land Reserve (ALR).

While the previous entrance (including administration building and weigh scales) was legal non-conforming, the new site requires a rezoning (see attached "Map B"). The future land use map of the Kelowna 2030 - Official Community Plan already designates this area for Public Service Utilities in anticipation of the new entrance. However, the boundaries of the OCP designation were based on an early design. The final design concept requires a minor change to the area presently designated in the OCP (see attached Map "A").

## 3.0 Land Use Management

Land Use Management recognizes the significance of rezoning lands currently zoned for agriculture to a utility use. Staff is committed to the preservation and protection of the City's limited agricultural lands. However, on occasion, this must be balanced with proposals that meet a critical public need. In this case, the public need has been identified in the OCP, the *Glenmore Landfill Comprehensive Site Development Plan*<sup>1</sup>, and the *City of Kelowna Agriculture Plan*<sup>2</sup>. The public need has also been acknowledged by the Agricultural Land Commission (ALC) and the proposal has received conditional approval<sup>3</sup>. Finally, the Advisory Planning Commission (APC) supported the proposal at its meeting of June 21, 2011 and viewed it as an enhancement of the landfill and an efficient use of land.

In this instance, the mandate to protect agricultural lands must be reconciled with the need to relocate existing inadequate landfill facilities to the most suitable location. To this end, staff reviewed other potential locations for the new facilities before determining the proposed location as the most appropriate. The details of this location analysis are provided in Section 3.2 of this report, and Staff are satisfied that the proposed location provides the greatest public benefit and the most limited impact on agriculture.

Further, the stringent conditions required in the ALC's approval (detailed in Section 3.1 of this report) work to ensure that the City provides benefits to the existing agricultural lands and mitigation measure to ensure that ongoing agricultural operations are not negatively impacted by landfill operations, including improved access, irrigation, fencing, land reclamation and rehabilitation, and security of tenure.

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<sup>1</sup> *Comprehensive Site Development Plan: Glenmore Landfill*, prepared by CH2M Hill for the City of Kelowna, dated July, 2008.

<sup>2</sup> *City of Kelowna Agriculture Plan*, 1998.

<sup>3</sup> The Agricultural Land Commission considered the application (#51741) on November 25, 2010 and provided conditional approval under Resolution #2282/2010.

Finally, the minor amendment to the boundary of the future land use designation to reflect the updated layout of the entrance is not seen to have any impact on the 20-year Servicing Plan.

## 4.0 Proposal

### 4.1 Background

The proposed new entrance and associated infrastructure are situated on the southeast portion of the landfill property adjacent to the existing composting facilities and on land owned by the City zoned for agriculture and situated in the ALR. The area identified for use for the entrance facilities is approximately 8 ha in area.

The City's *Comprehensive Site Development Plan*<sup>4</sup> (July, 2008) for Glenmore Landfill identified the need for a new entrance, and associated entrance facilities, to accommodate existing and future demand. Specifically, the existing entrance was deemed to be insufficient to meet increasing demand, and the entrance facilities were shown to be inadequate and approaching the end of their functional lifespan. Excess traffic that cannot be accommodated in the existing entrance backs up directly onto Glenmore Road. Also, the existing weigh scales are too short to accommodate semi trailers.

The access for the proposed entrance is from a new road that is slated for construction through the City-owned lands at the south end of the landfill properties. This road is identified in the 20 Year Major Road Network of the OCP and is intended to be a future link that will connect to John Hindle Drive to the east through to Highway 97 (see map below).

On February 10, 2010, the City applied to the Agricultural Land Commission (ALC) for permission to undertake the necessary works, including the entrance facilities. The ALC gave the City a conditional approval on December 15, 2010, with the following conditions:

- Lot consolidation;
- Agriculture plan;
- Soil management plan;
- Agricultural rehabilitation plan;
- Provision of affordable irrigation water to farmers; and
- Provision of safe road access for livestock and farm equipment.

Those conditions that can be completed prior to the development taking place have been or are well underway, while the remaining will be completed shortly upon completion of the proposal within the three (3) year timeframe given by the ALC.

The City has also made application for a voluntary Development Permit to address the form and character of the proposed administration building, which will be executed at a staff level.

### 4.2 Project Description

The proposed location of the landfill entrance generally takes advantage of the gradual move southward of the working face of the landfill, and of the proposed east-west connection to John Hindle Drive planned in the OCP. Within the City-owned lands abutting the south end of the

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<sup>4</sup> *Comprehensive Site Development Plan: Glenmore Landfill*, prepared by CH2M Hill for the City of Kelowna, dated July, 2008.

landfill, the proposed location also minimizes agricultural impacts, as it is situated on the side of a hill the majority of which is not currently used for agricultural production. So, while the zoning proposal includes over 8 ha of land, it is anticipated that only 1.6 ha of land currently under agricultural production will be disrupted for the entrance facilities.

The attached Map “B” shows the boundaries of the proposed zoning, which is intended to coincide with that area presently designated for public utility use in the OCP. Under present A1 zoning, the proposed entrance would not be considered permitted. In order to allow the construction of the new entrance, a rezoning to P4 is required. Under the P4 zone, the proposed use is considered under “utility services, major impact”. A minor adjustment to the OCP future land use map is also required to reflect an updated layout for the new entrance (attached as Map “A”).

Within the zoned area, the attached site plan illustrates the extent of the proposed entrance and associated infrastructure. The new entrance has been designed to provide:

- Separate inbound and outbound scales with entrance/exit roadways of sufficient length to accommodate existing and future vehicle queues without impacting offsite roadways;
- A waste transfer site to minimize small vehicle traffic at the landfill working face;
- A separate drop-off area for recyclables and for special and bulky waste;
- A pull-off area where customers can safely prepare loads for dumping; and
- An administrative building.

#### 4.3 Site Context

The subject lands contain portions of multiple parcels owned by the City of Kelowna that together form the Glenmore Landfill. The landfill is generally situated in an area characterized by rural and agricultural uses, with the exception of a multiple-family housing development adjacent to the southwest end of the landfill (Yaletown).

Presently, the subject properties consist of several smaller parcels. However, the City will be consolidating these into two parcels in fulfillment of a condition of the ALC, and as shown on the attached Consolidation Plan.

Direction	Zone
North	Agriculture 1 - A1
West	Agriculture 1 - A1
East	Agriculture 1 - A1
South	Agriculture 1 - A1

4.4 Subject Property Map: See attached Map “B” - Proposed Zoning

#### 4.5 Zoning Analysis Table

Zoning Analysis Table for Administration Building		
CRITERIA	PROPOSAL	P4 ZONE REQUIREMENTS
Development Regulations		
Floor Area of Administration Building	613 m <sup>2</sup>	N/A

Height	8.6 m	10 m
Front Yard	Exceeds	6 m
Side Yard (north)	Exceeds	4.5 m
Side Yard (south)	Exceeds	4.5 m
Rear Yard	Exceeds	4.5 m
<b>Other Regulations</b>		
Off-street Parking	45	N/A
Bicycle Parking	10	N/A
Loading Space	N/A	N/A

## 5.0 Current Development Policies

### 5.1 Kelowna 2030 - Official Community Plan (OCP)

#### Agricultural Land Use Policies:

**Non-farm Uses<sup>5</sup>.** Support for non-farm uses applications on agricultural lands only where where approved by the ALC and where the proposed uses:

- are consistent with the Zoning Bylaw and OCP;
- provide significant benefits to local agriculture;
- can be accommodated using existing municipal infrastructure;
- minimize impacts on productive agricultural lands;
- will not preclude future use of the lands for agriculture; and
- will not harm adjacent farm operations.

#### Infrastructure Policies:

**Sustainable Infrastructure Planning<sup>6</sup>.** Apply sustainable decision-making approaches in infrastructure planning and procurement.

**Multiple Bottom Line<sup>7</sup>.** Ensure a multiple bottom line approach is applied to all infrastructure planning projects.

**Minimize Impacts on Agricultural Land<sup>8</sup>.** Minimize the impact of penetration of road and utility corridors through agricultural lands, utilizing only those lands necessary and to the maximum capacity prior to seeking new corridors. Provision should be made for farm traffic to cross major roads.

#### Solid Waste Policies:

<sup>5</sup> City of Kelowna Official Community Plan, Policy No.5.33.7, Chapter 5

<sup>6</sup> City of Kelowna Official Community Plan, Objective No.7.1, Chapter 7

<sup>7</sup> City of Kelowna Official Community Plan, Policy No.7.1.4, Chapter 7

<sup>8</sup> City of Kelowna Official Community Plan, Policy No.7.5.1, Chapter 7

**Glenmore Landfill<sup>9</sup>.** Continue to use the Glenmore Landfill facility for the disposal of waste in accord with the Regional Solid Waste Management Plan and the Comprehensive Site Development Plan (July 2008).

## 5.2 City of Kelowna Agriculture Plan (1998)

**Associated Community Growth Needs<sup>10</sup>.** Other civic needs related to the long term commitment to the Glenmore Landfill Site ... have been acknowledged by the Land Commission as part of the Official Community Plan. These lands would not need to be excluded from the ALR. The Glenmore Landfill site may ultimately be converted to recreation or agriculture uses when the life of the current landfill is exhausted.

## 6.0 Technical Comments

### 6.1 Building & Permitting Department

- 1) Development Cost Charges (DCC's) are required to be paid prior to issuance of any Building Permit(s) for new construction.
- 2) Full Plan check for Building Code related issues will be done at time of Building Permit applications.
- 3) An alternative solution would be required to be submitted and approved for the lack of connection to the sewer system.

### 6.2 Development Engineering Department

See Attached.

### 6.3 Policy & Planning

The subject properties are designated as Resource Protection Area and Public Services / Utilities in the OCP.

It is recommended that this application be supported subject to confirmation that the proposed building will be located within the appropriate Public Services / Utilities designated portion of the property and subject to any requirements of the Farm Protection DP.

### 6.4 Fire Department

Fire department access, fire flows, and hydrants as per the BC Building Code and City of Kelowna Subdivision Bylaw #7900. The Subdivision Bylaw requires a minimum of 150ltr/sec flow. There should be one civic address for each of the buildings and individual suite numbers for all the occupancies.

### 6.5 Real Estate & Building Services

No comment.

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<sup>9</sup> City of Kelowna Official Community Plan, Policy No.7.25.2, Chapter 7

<sup>10</sup> City of Kelowna Agriculture Plan, 1998, Pg. 124

6.6 Public Health Inspector

No comment.

6.7 Glenmore-Ellison Improvement District

See attached.

6.8 Telus

TELUS will provide underground facilities to this development. Developer will be required to supply and install conduit as per TELUS policy.

6.9 Terasen Utility Services

No comment.

6.10 Fortis

No comment.

6.11 RCMP

No comment.

6.12 Shaw Cable

No requirements as C/Kelowna doesn't want our services to new landfill administration building.

**7.0 Application Chronology**

Date of Application Received: May 10, 2011

Advisory Planning Commission June 21, 2011

The above noted application was reviewed by the Advisory Planning Commission at the meeting on June 21, 2011 and the following recommendations were passed:

THAT the Advisory Planning Commission support Rezoning Application No. Z11-0037, for 1595 Glenmore Road N (portion of) and 2905 McKinley Road, to rezone the subject property from the A1-Agriculture 1 zone to the P4-Utilities zone to address proper use of Public Service Utility.

Anecdotal Comment:

The Advisory Planning Commission supported the Rezoning Application as it is an enhancement to the City's Landfill, and an efficient and appropriate land use for long-term utility planning.

Agricultural Advisory Committee July 14, 2011

The above noted application was reviewed by the Agricultural Advisory Committee at the meeting on July 14, 2011 and the following recommendation was passed:

THAT the Agricultural Advisory Committee supports Rezoning Application No. Z11-0037 by the City of Kelowna for a portion of 1595 Glenmore Road North to rezone a portion of the subject property from the A1 - Agriculture 1 zone to the P4 - Utilities zone in order to construct a new entrance and associated infrastructure for the Glenmore Landfill.

Anecdotal Comment:

The Agricultural Advisory Committee believes that this rezoning application will add value to the agricultural lands (i.e. Tutt Ranch) and thanked staff for thinking "outside of the box" with respect to the reuse of lands for agricultural purposes upon cell closure and remediation.

**Report prepared by:**



James Moore, Environment & Land Use Planner

**Reviewed by:**



Todd Cashin Manager, Environmental Land Use Management

**Approved for Inclusion:**



Shelley Gambacort, Director, Land Use Management

**Attachments:**

Map "A" - Proposed OCP

Map "B" - Proposed Zoning

Site Plan

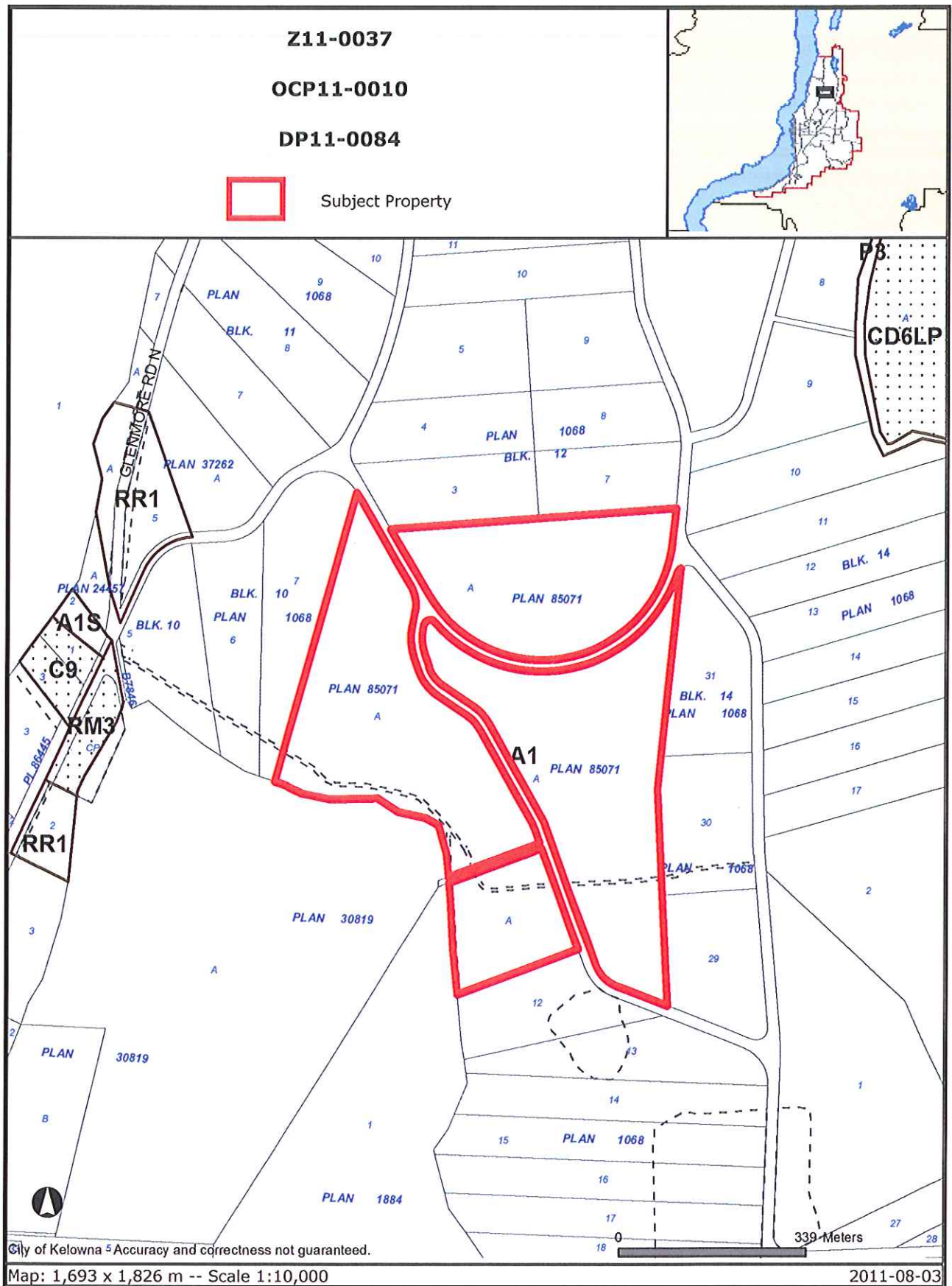
Consolidation Plan

Entrance Facilities Plan

Glenmore-Ellison Improvement District letter, dated June 24, 2011

Development Engineering Department comments, dated June 7, 2011



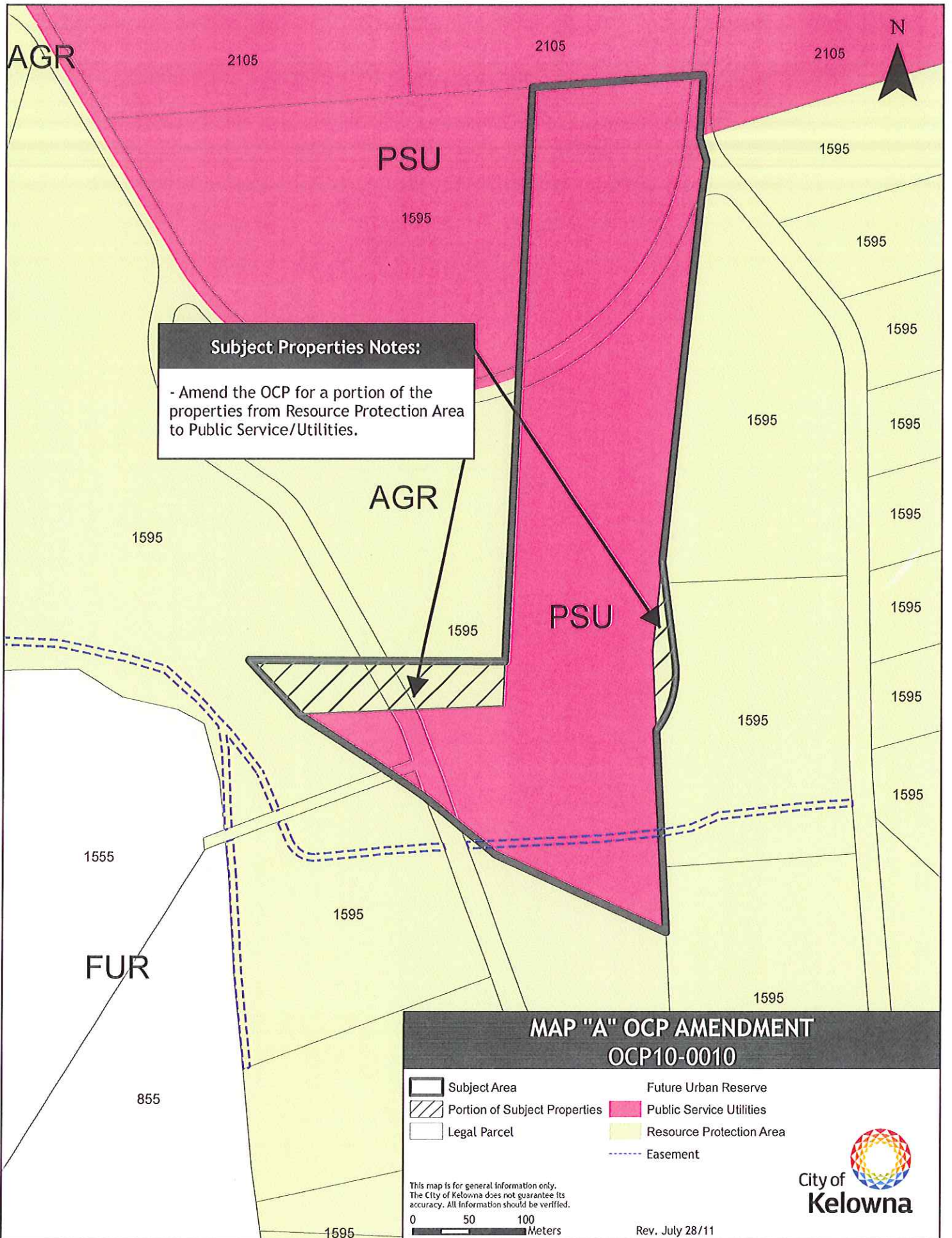


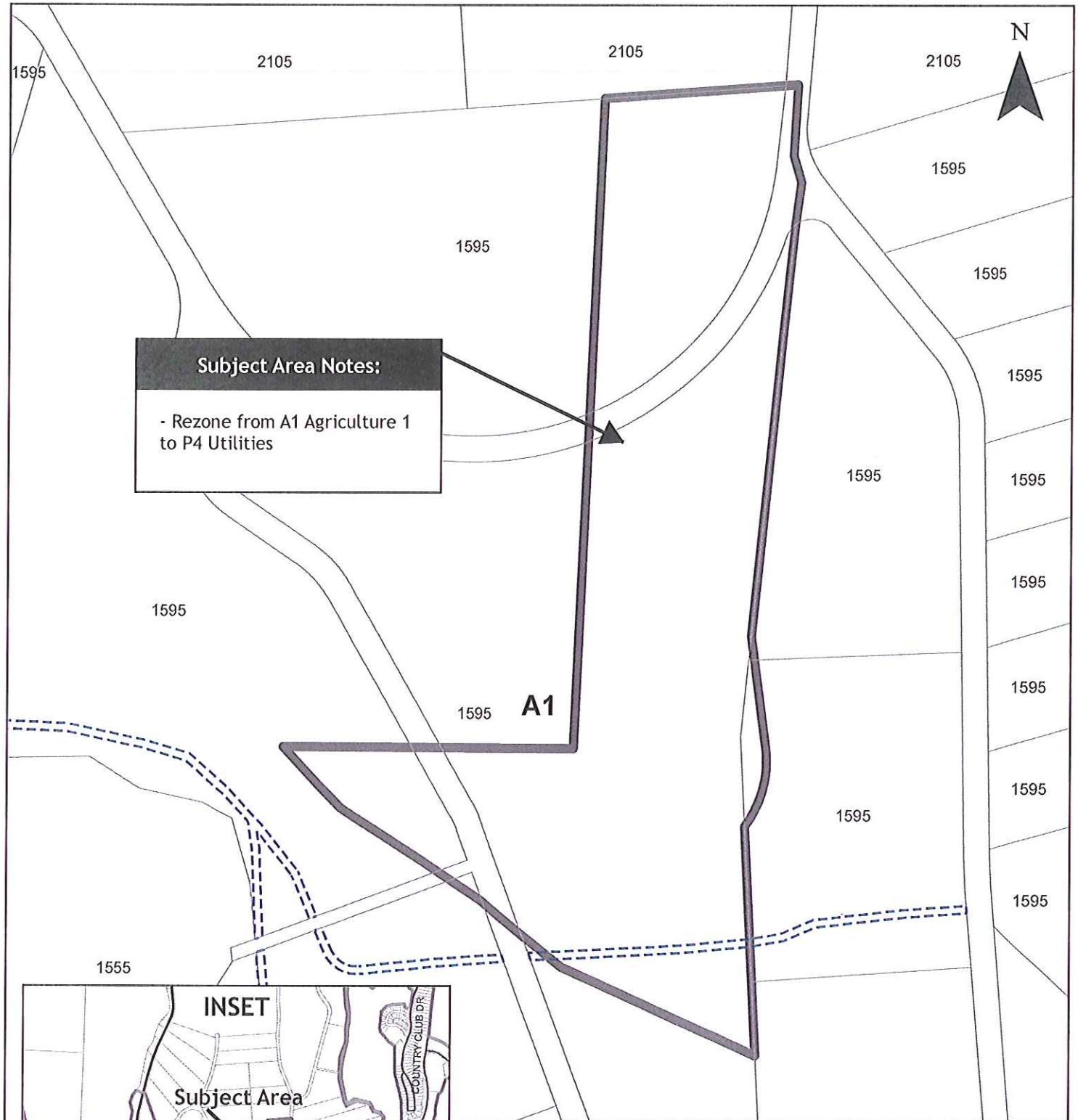
City of Kelowna Accuracy and correctness not guaranteed.

Map: 1,693 x 1,826 m -- Scale 1:10,000

2011-08-03

Certain layers such as lots, zoning and dp areas are updated bi-weekly. This map is for general information only. The City of Kelowna does not guarantee its accuracy. All information should be verified.

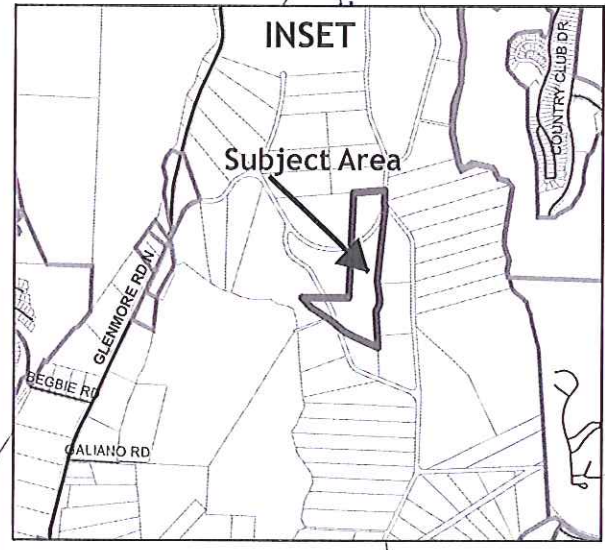




**Subject Area Notes:**

- Rezone from A1 Agriculture 1 to P4 Utilities

**A1**



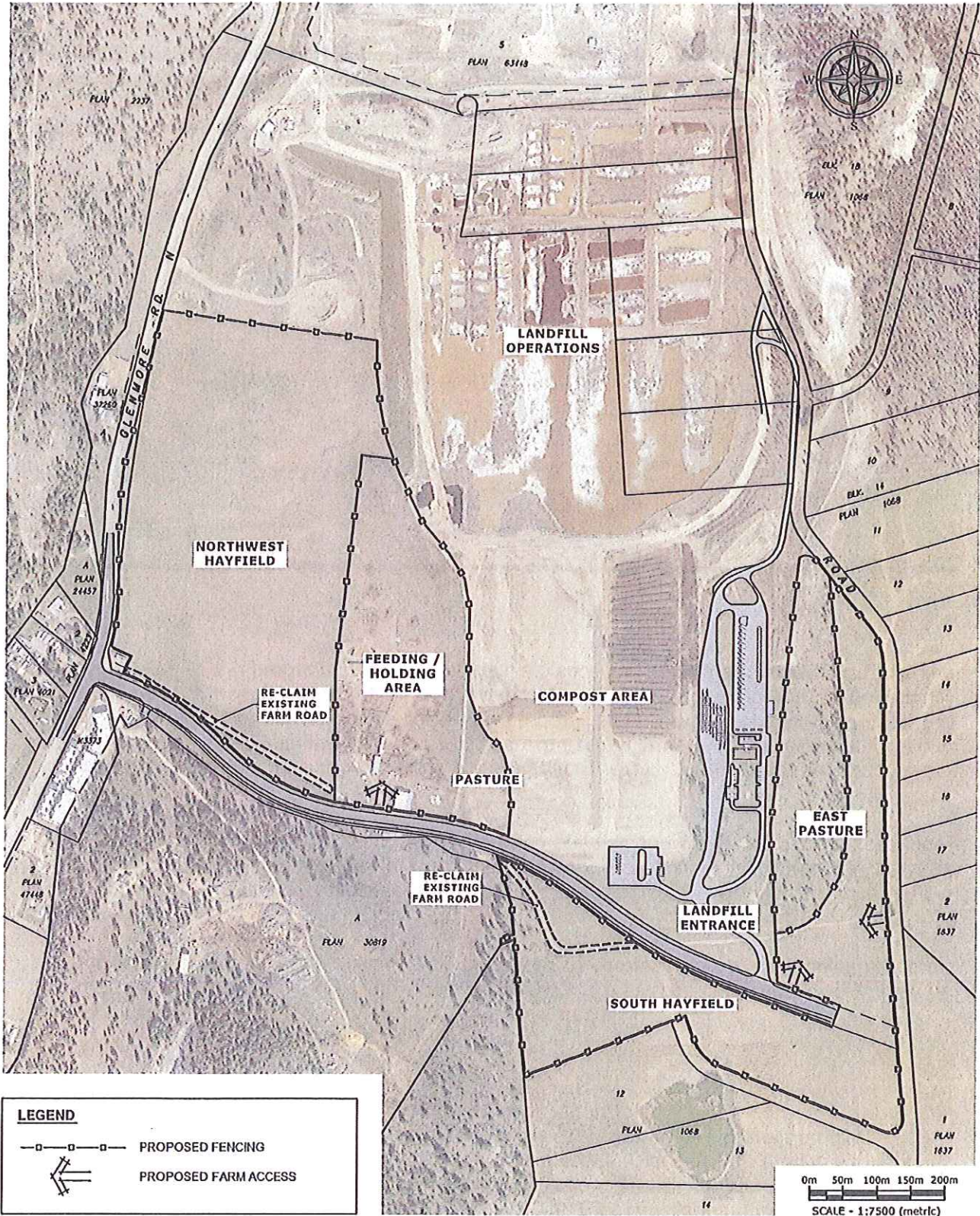
**MAP "B" PROPOSED ZONING**  
Application #Z11-0037

- Subject Area
- Zoning
- Legal Parcel
- Easement

This map is for general information only. The City of Kelowna does not guarantee its accuracy. All information should be verified.



Rev. July 28/11

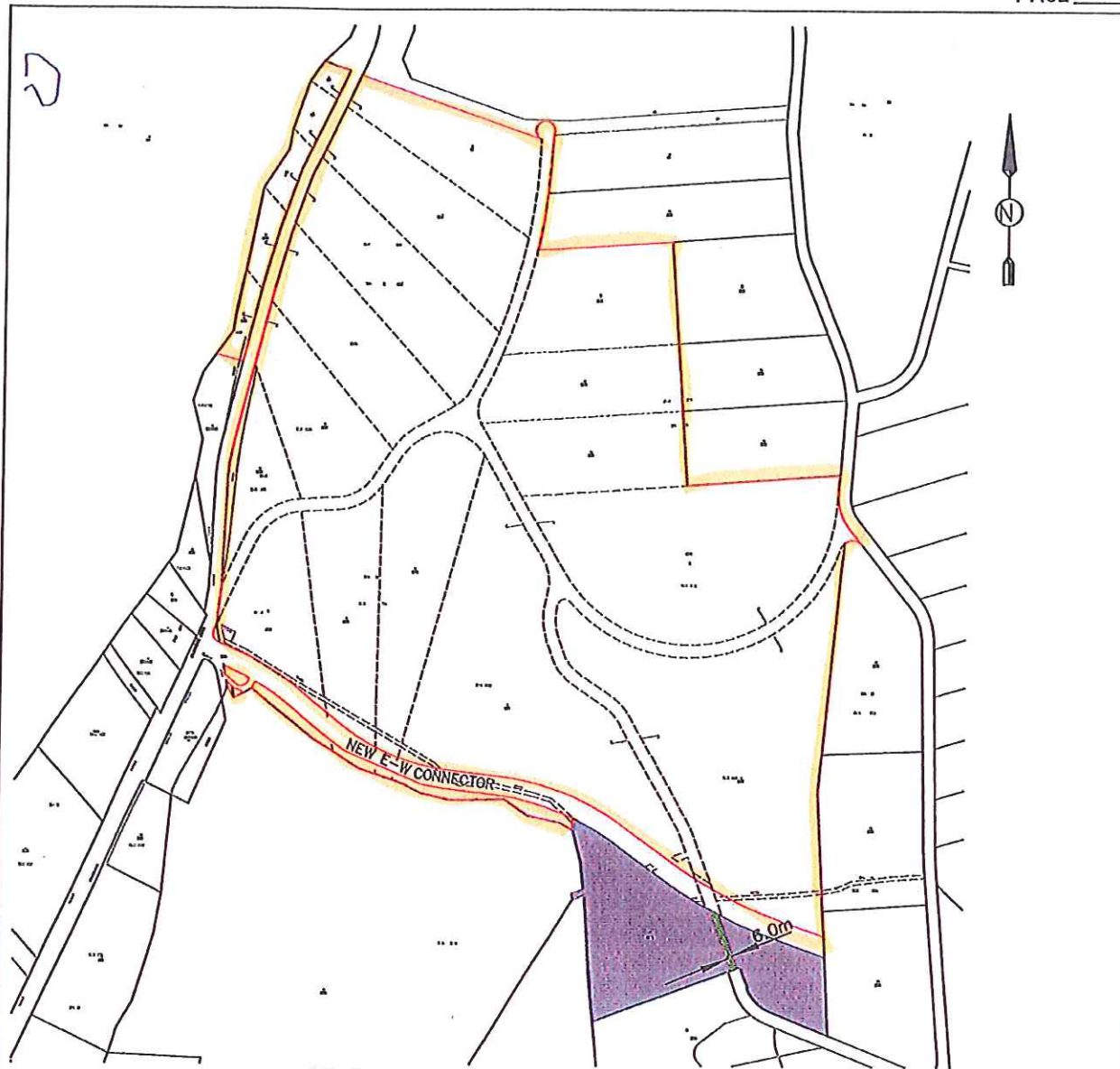


**GLENMORE LANDFILL AGRICULTURAL PLAN  
FARM ACCESS / FENCING PLAN**

**FIGURE 4**

DATE: MAR. 14, 2011

PROJECT #: 5111009



SCALE N.T.S.

MAILING ADDRESS \_\_\_\_\_

LEGAL DESCRIPTION: LOT NO. \_\_\_\_\_ PLAN NO. \_\_\_\_\_  
SEC. 15 TWP. 23

- PROPOSED LOT 1 AREA = 873634sq.m.±
- PROPOSED LOT 2 AREA = 63642sq.m.±
- DRAINAGE ROW AREA = 589sq.m.±

1742

DATE: JUNE 30/11

DRAWING NO. \_\_\_\_\_

END OF DOCUMENT

# CONSOLIDATION PLAN





Glenmore-Ellison Improvement District  
445 Glenmore Road  
Kelowna, BC V1V 1Z6

FILE COPY

Phone: 250-763-6506

Email: glenmore.ellison@shaw.ca  
Website: www.glenmoreellison.com

Fax: 250-763-5688

June 24, 2011

City of Kelowna  
Community Sustainability  
1435 Water St.  
Kelowna, BC V1Y 1J4

**Attention: James Moore**

**Re: Application Z11-0037 & DP11-0084  
Landfill Administration Building -  
Lot A, KAP85071 – 1595 Glenmore Rd. N**

Glenmore-Ellison Improvement District (GEID) has completed a review of the proposed rezoning application for a Landfill Administration Building to be located at the Glenmore Landfill on Lot A, KAP85071. The subject property is located within GEID boundaries and is assessed by GEID with 70.93 acres of dry land and 33.5 acres of A grade land. The building will be constructed on a portion of the dry land.

The applicant is constructing a two-storey building for the Glenmore Landfill Administration offices. Based on the February 18, 2011 drawings by CEI Architecture Planning Interior, as provided with the subject application, the proposed building area including composters is approximately 625 m<sup>2</sup>.

The following sections describe the water servicing requirements to meet GEID servicing bylaws and policies.

#### **Fireflow Availability and Hydrants**

Hydrant spacing and flow rates must conform to City of Kelowna Bylaw # 7900. GEID understands that the City of Kelowna inspections department obtains comments from the Kelowna Fire Department prior to issuance of building permit.

No FUS fire flow requirements for the proposed building have been received therefore GEID is not in a position to comment on whether sufficient fire flows are available at this time.

#### **Waterworks**

The applicant is responsible for the construction and extension of watermains within the property. Currently, GEID has a watermain running east-west through the property, which we understand may be modified as part of the construction of John Hindle Drive and the landfill entrance. Design drawings for the roadway which included some water servicing details were provided to GEID for review by Associated Engineering.

### **Irrigation and Metering**

As specified in GEID Bylaw #76, a water meter must be installed on all new water services. For facilities with a single water meter, GEID requires that a meter room or building be provided in accordance with our standard specification. Meter building plans including mechanical details and installation clearances must be reviewed and approved by GEID prior to construction, and constructed in accordance with the current specifications prior to water servicing at the site.

Water meters shall be purchased by the applicant and installed according to manufacturer's requirements. All meters shall be supplied with a remote meter reading system compatible with the Sensus RadioRead™ system. The remote MXU shall be located outside the building near the entrance door, and shall be in line-of-sight from a publicly accessible roadway. If the building is sprinklered, either an alarm check sprinkler system or else a fireline meter as shown in GEID's standard specification shall be installed.

The irrigation system shall be connected to the water system after the water meter. GEID requires that irrigation system mechanical plans conforming to GEID Bylaw #76 be submitted for review. The bylaw includes a 10 US gpm flow rate for domestic underground sprinklers. If additional irrigation flows are requested by the Applicant, GEID will review the irrigation drawings and determine whether additional irrigation flow allotment is available, along with the costs for system upgrades and CECs.

### **Capital Expenditure Charges (CEC's)**

The floor area for the building is approximately 625 m<sup>2</sup>. GEID Bylaw # 84 states that dry land CEC's are payable at \$3,600 minimum charge for the first 250 m<sup>2</sup> of building floor area. At this time, GEID has not received any information whether the building will be sprinklered or not. Currently, the rate for additional floor area over 250m<sup>2</sup> for buildings with an approved sprinkler system is \$8.00/m<sup>2</sup>; the rate for additional floor area for unsprinklered buildings is \$10.00/m<sup>2</sup>. These rates are subject to change without notice, and higher rates are expected in the upcoming revision to GEID's CEC Bylaw, which is expected to be approved in the summer of 2011.

Please note that GEID requires payment of CEC's based on total building floor area. In the event that any future building expansion which increases usable floor area is completed, additional CEC's would be required at that time, at the CEC rate in force at time of payment. In order to determine the CECs payable, GEID requires confirmation of the building floor area, and also whether the building will be sprinklered.

### **Connection, Administration and Inspection Fees**

Subject to servicing information to be provided by the Applicant, connection, administration and/or inspection fees may apply.

### **New Account Fees**

No new account fee applies.



Application Z11-0037 & DP11-0084  
June 24, 2011

**Water Tolls**

Water tolls will be charged in accordance with current GEID bylaws for commercial properties. Currently, the monthly minimum rate is \$35.20 for the first 30m<sup>3</sup> with additional consumption charged at \$0.25/m<sup>3</sup>.

If you have any questions please do not hesitate to contact my office at (250) 763-6506.

Sincerely,

**GLENMORE-ELLISON  
IMPROVEMENT DISTRICT**



Darren Schlamp, B.Sc.  
Operations Manager

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CITY OF KELOWNA  
MEMORANDUM

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**Date:** June 7, 2011  
**File No.:** Z11-0037 DP11-0084  
**To:** Land Use Management Department (JM)  
**From:** Development Engineering Manager  
**Subject:** 1595 Glenmore Rd N A1 to P4

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Development Engineering Services have the following requirements associated with this rezoning Application.

1. Domestic Water and Fire Protection

This development is within the service area of the Glenmore Ellison Irrigation District (GEID). The developer is required to make satisfactory arrangements with the GEID for these items. All charges for service connection and upgrading costs are to be paid directly to the GEID.

2. Sanitary Sewer

Sanitary sewage is to be handled by an on-site sewage composting disposal system subject to approval of the Provincial Public Health Officer. Please contact the Public Health Officer.

3. Electric Power and Telecommunication Services

It is the applicant's responsibility to make a servicing application with the respective electric power, telephone and cable transmission companies to arrange for service upgrades to these services which would be at the applicant's cost.

  
\_\_\_\_\_  
Steve Muenz, P. Eng.  
Development Engineering Manager

DC

**REZONING: GLENMORE LANDFILL  
ADMINISTRATION BUILDING  
REZONING APPLICATION (A1➔P4)**

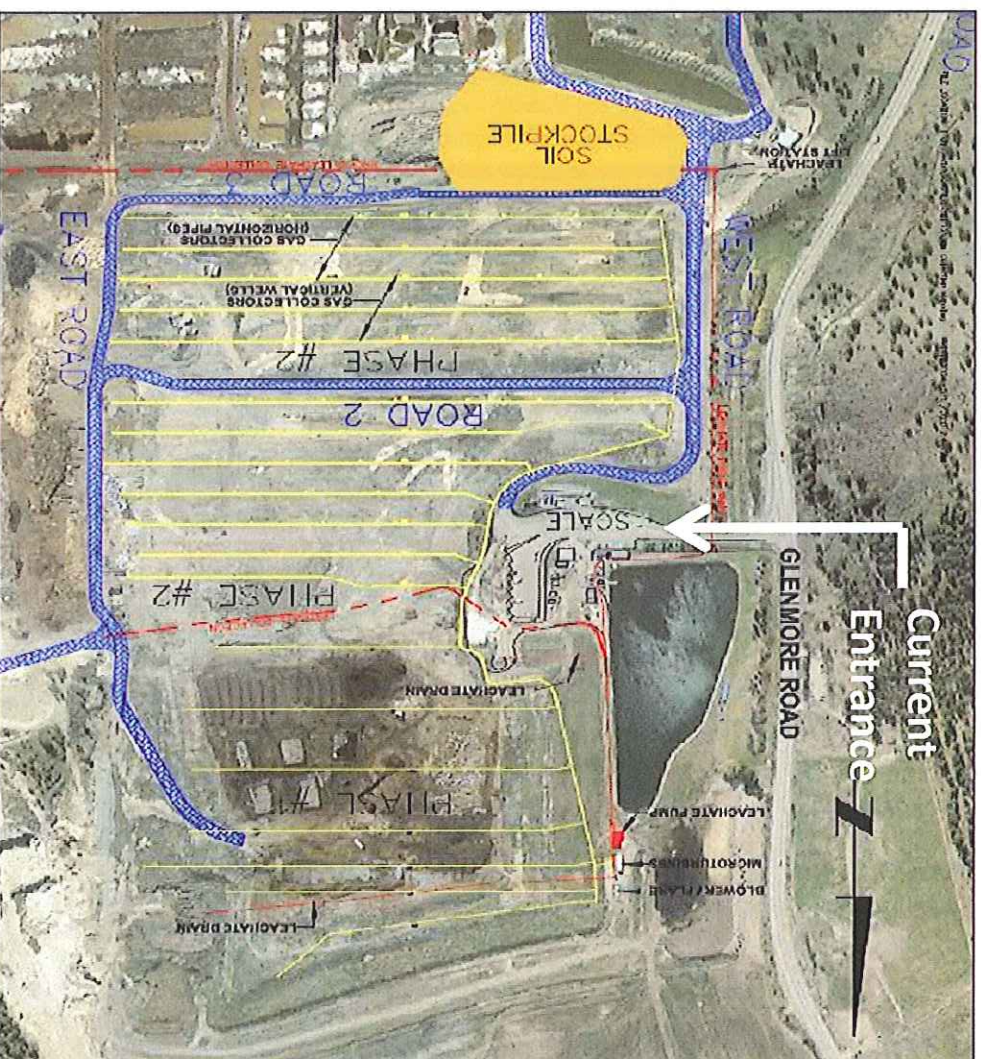


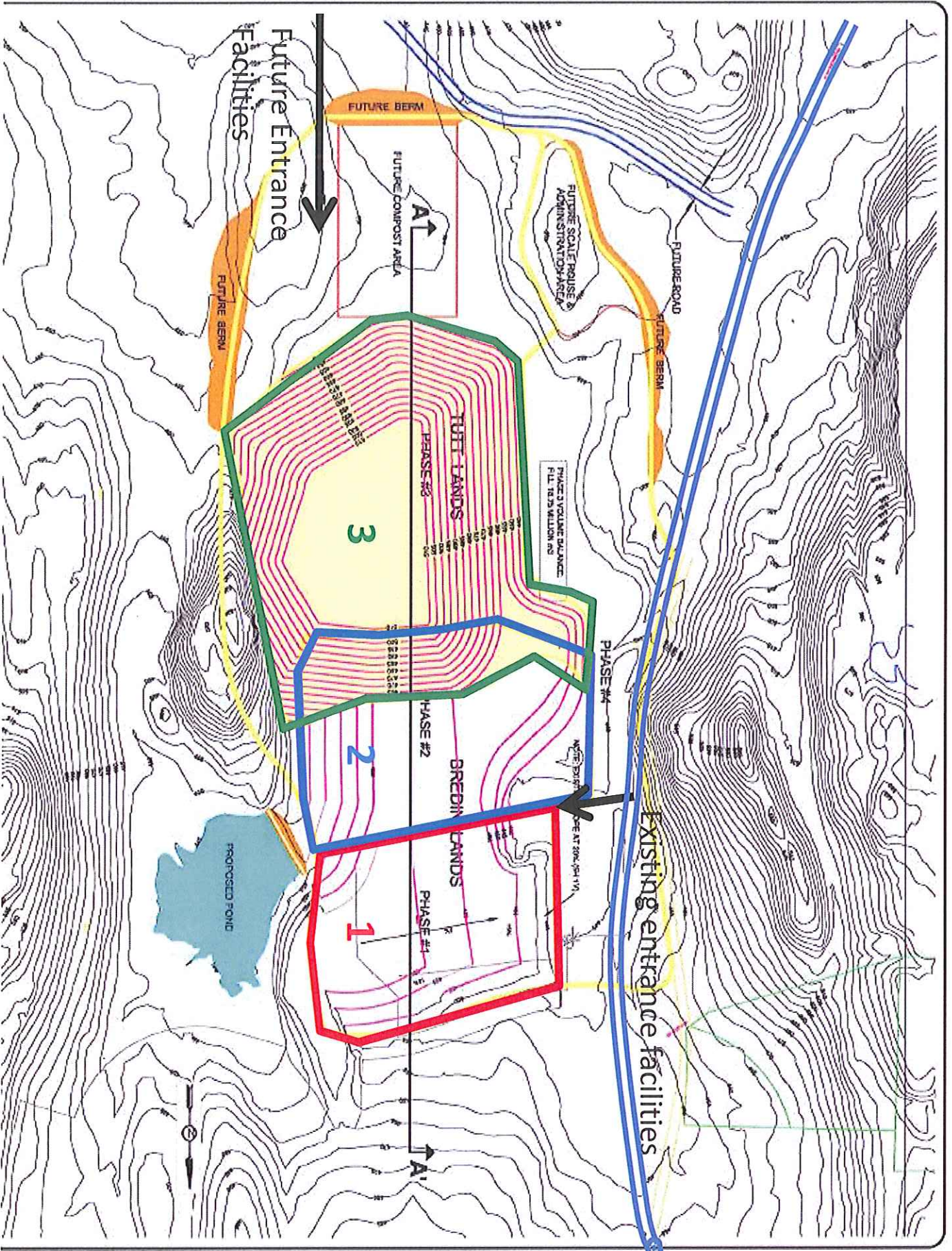
City of  
**Kelowna**



## Glenmore Landfill Planning

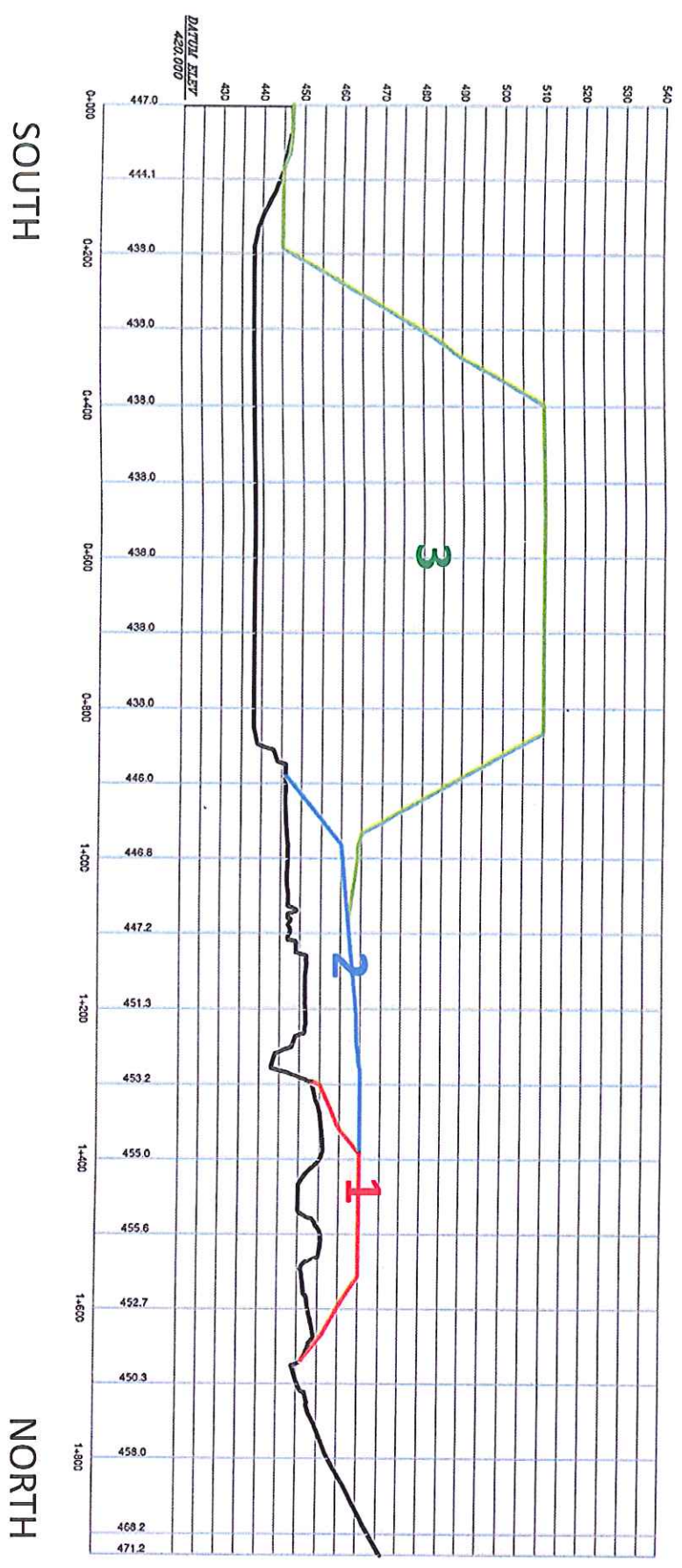
- ▶ Site Development Planning (1993, 2001)
- ▶ **Comprehensive Site Development Plan- 2008**
- ▶ Solid Waste Management Plan- 2008
- ▶ Gas Utilization Plan- 2010
- ▶ Financial Plan- 2010
- ▶ New Admin-road entrance- 2011-13





LEGEND:	CLIENT:
---	CITY:
---	PROJECT:
---	COUNTY:
---	TITLE:
---	SCALE:
---	1:3000
---	DESIGNER:

# LANDFILL BURIAL CROSS-SECTION



SOUTH

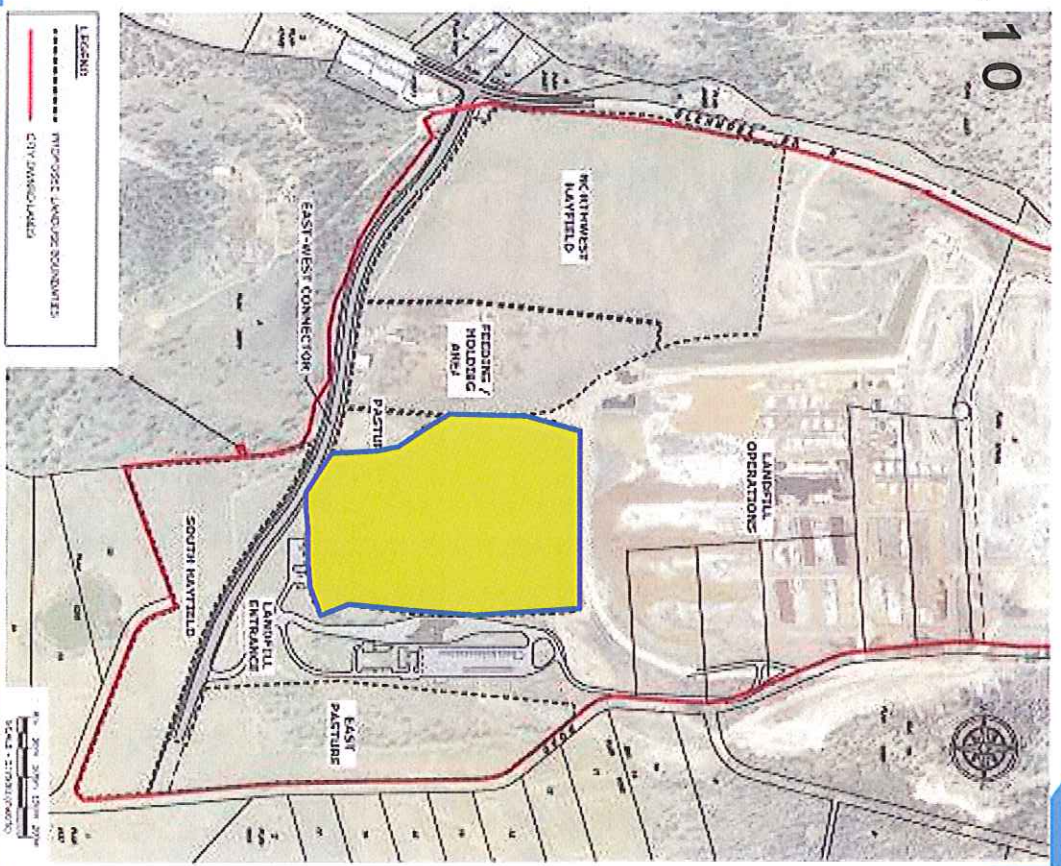
Note: vertical scale exaggerated by Factor of 5

NORTH

# ALC APPLICATION #51741

NON-FARM USE, 2010.02.10

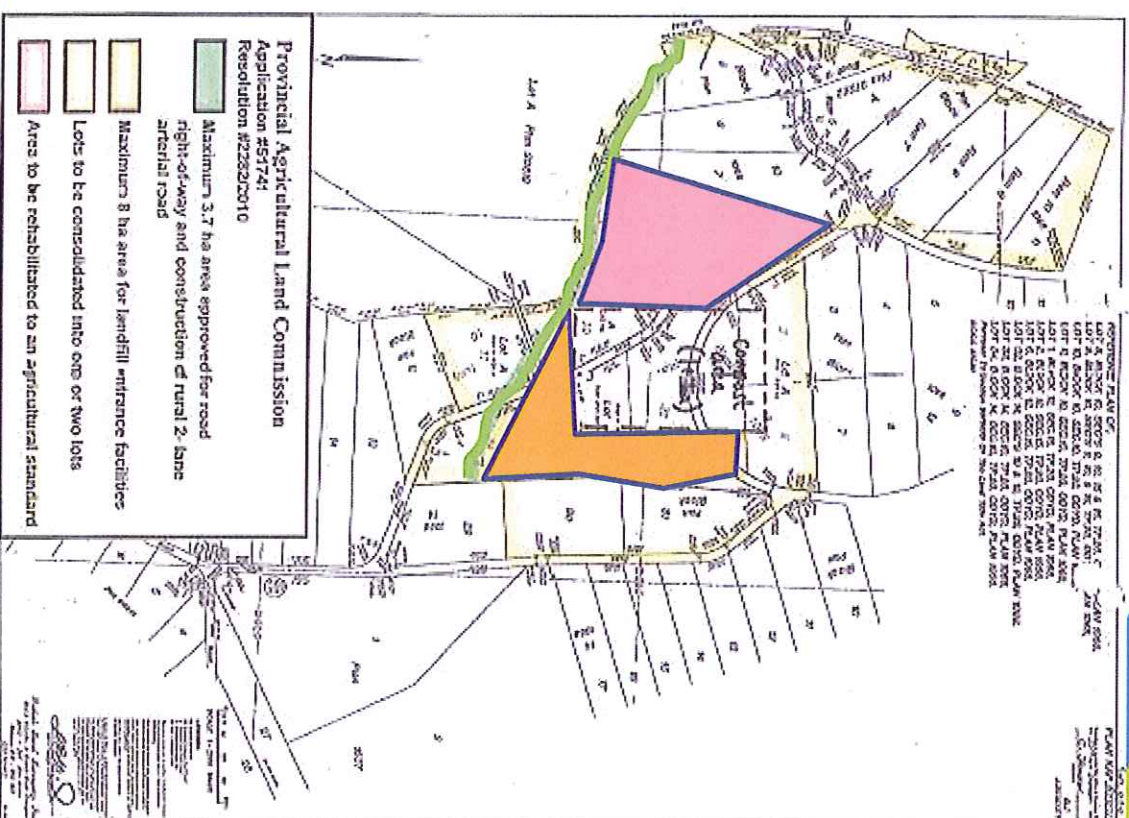
- ▶ 75.4 ha of Tutt Ranch (2006)
- ▶ Composting Facility
  - ▶ 10 ha (ALC appl. #36739, 25 year temporary use)
- ▶ Current uses:
  - ▶ Hayfields (39ha irrig)
  - ▶ Pasturing (5ha)
  - ▶ Cattle feeding & holding (7.5ha)



# ALC CONDITIONAL APPROVAL 2010.12.15

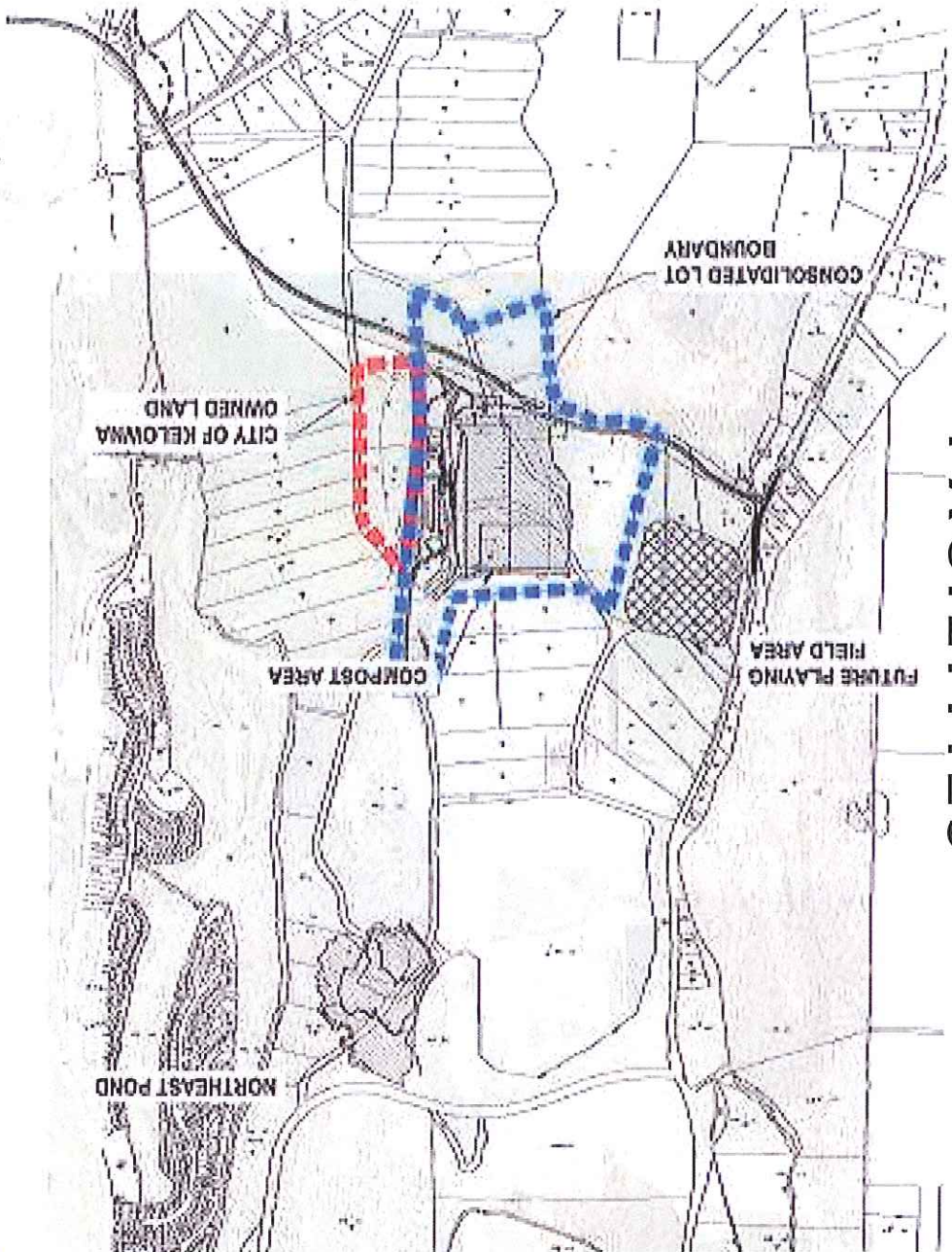
NON-FARM USE RES # 2282/2010

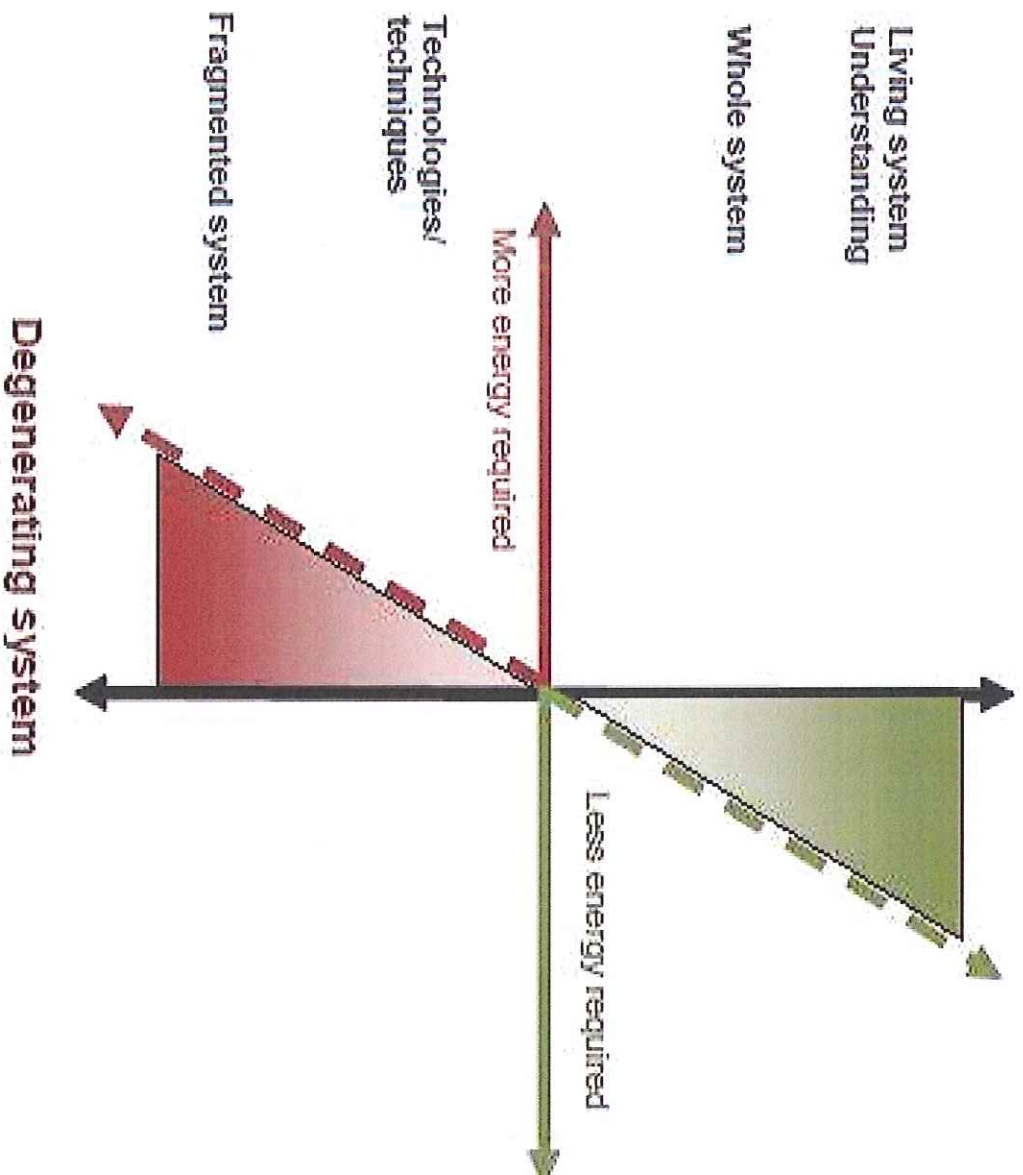
- ▶ Entrance Facilities- 8.0 ha
  - ▶ 0.8 ha Class 4AD
  - ▶ 0.8 ha Class 5
- ▶ Road ROW-3.7 ha
  - ▶ 1.1 ha Class 4
  - ▶ 1.3 ha Class 5





# GLENMORE LANDFILL ENTRANCE FACILITIES





**Regenerative design**  
Humans intentionally participate as nature — actively co-evolving the whole system

**Restorative design**  
Humans doing things to nature — assisting the evolution of sub-systems

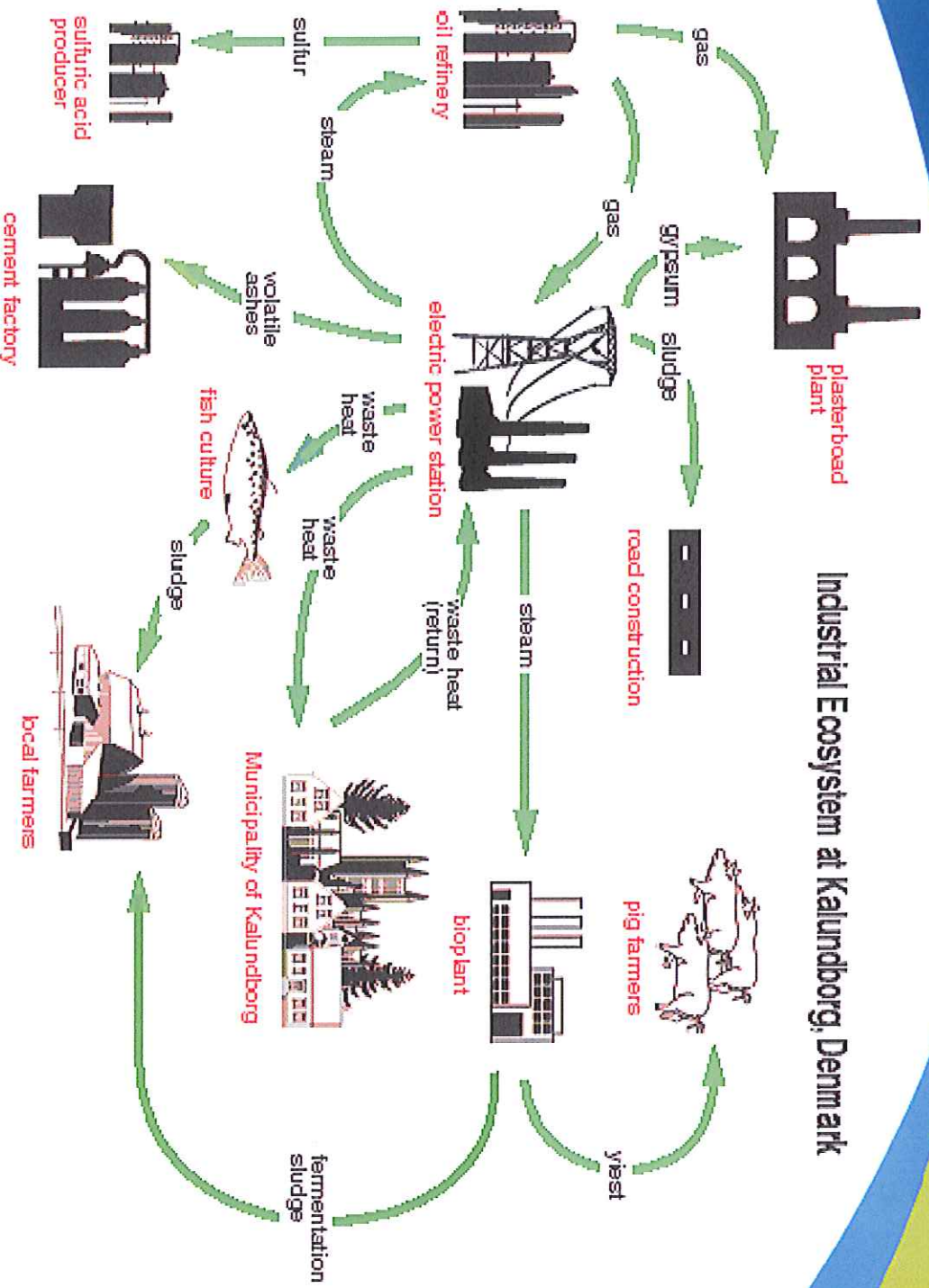
**Sustainable design**  
Neutral — “100% less bad” (McDonough)

**Green/high performance design**  
Relative improvement (environmental rating tools etc)

**Conventional practice**  
“One step better than breaking the law” (Croxtan)

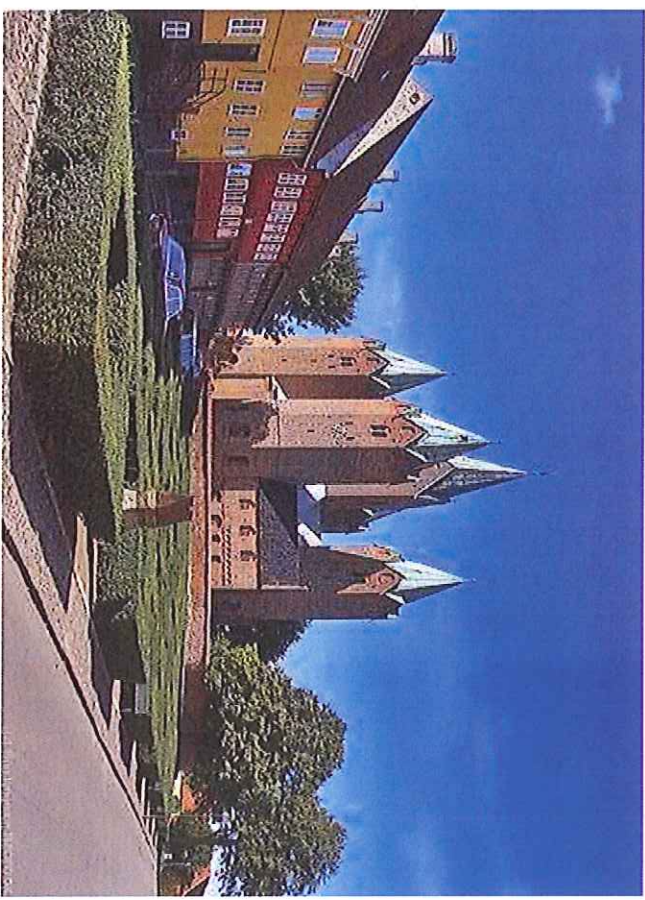
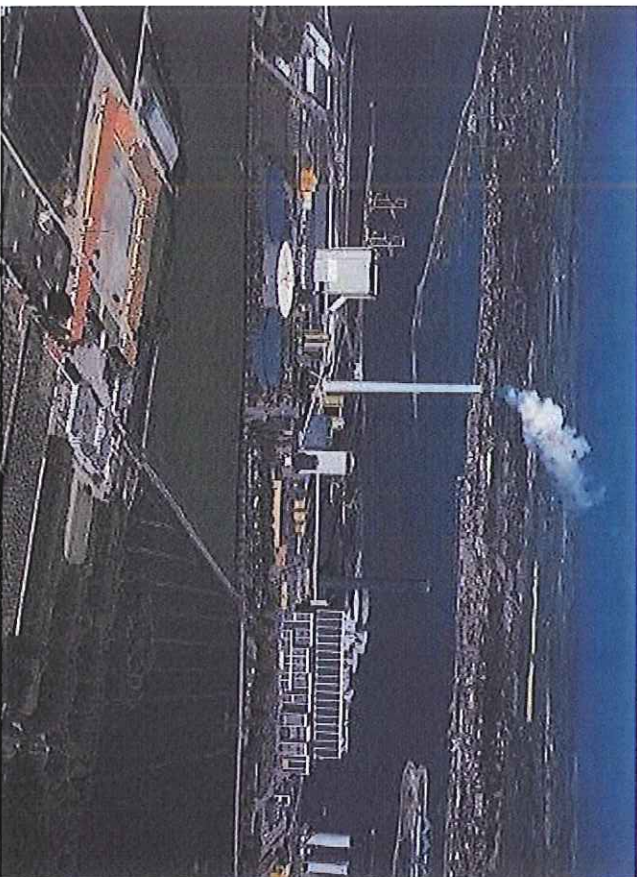
**Regenerative Design** is the application of ecological systems thinking to the design of the built environment. The objective is dynamic and holistic integration of human and natural systems to sustain on-going mutual benefit. This is fundamentally a place-making approach to facilitating a healthy, self-healing, evolving urban civilization

### Industrial Ecosystem at Kalundborg, Denmark



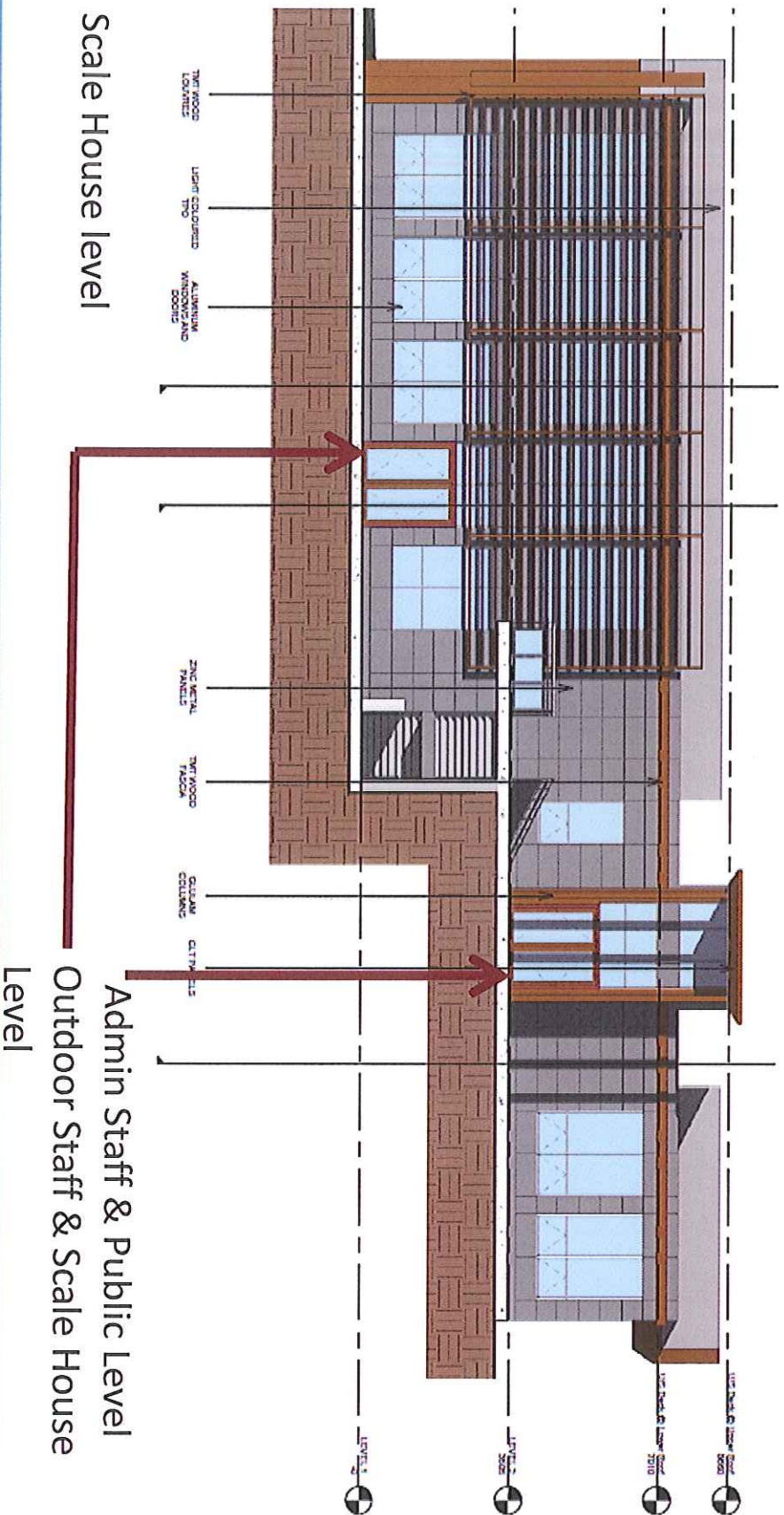
Industrial ecology is the shifting of industrial process from linear (open loop) systems, in which resource and capital investments move through the system to become waste, to a closed loop system where wastes become inputs for new processes.

# KALUNDBORG, DENMARK INDUSTRIAL ECOLOGY





# GRADE ACCESS FOR 2 STOREY



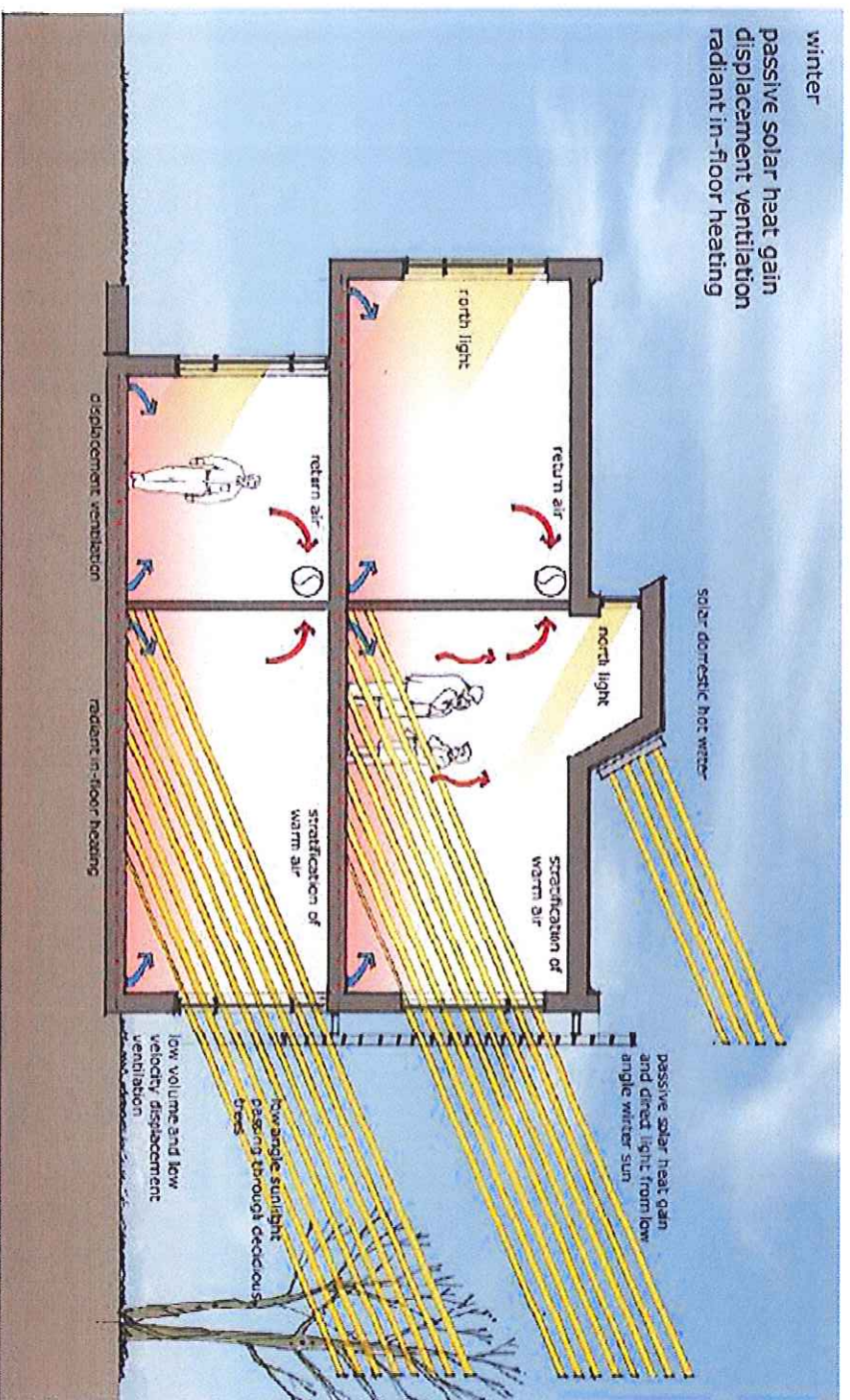
# SOUTH WEST PERSPECTIVE: SOLAR



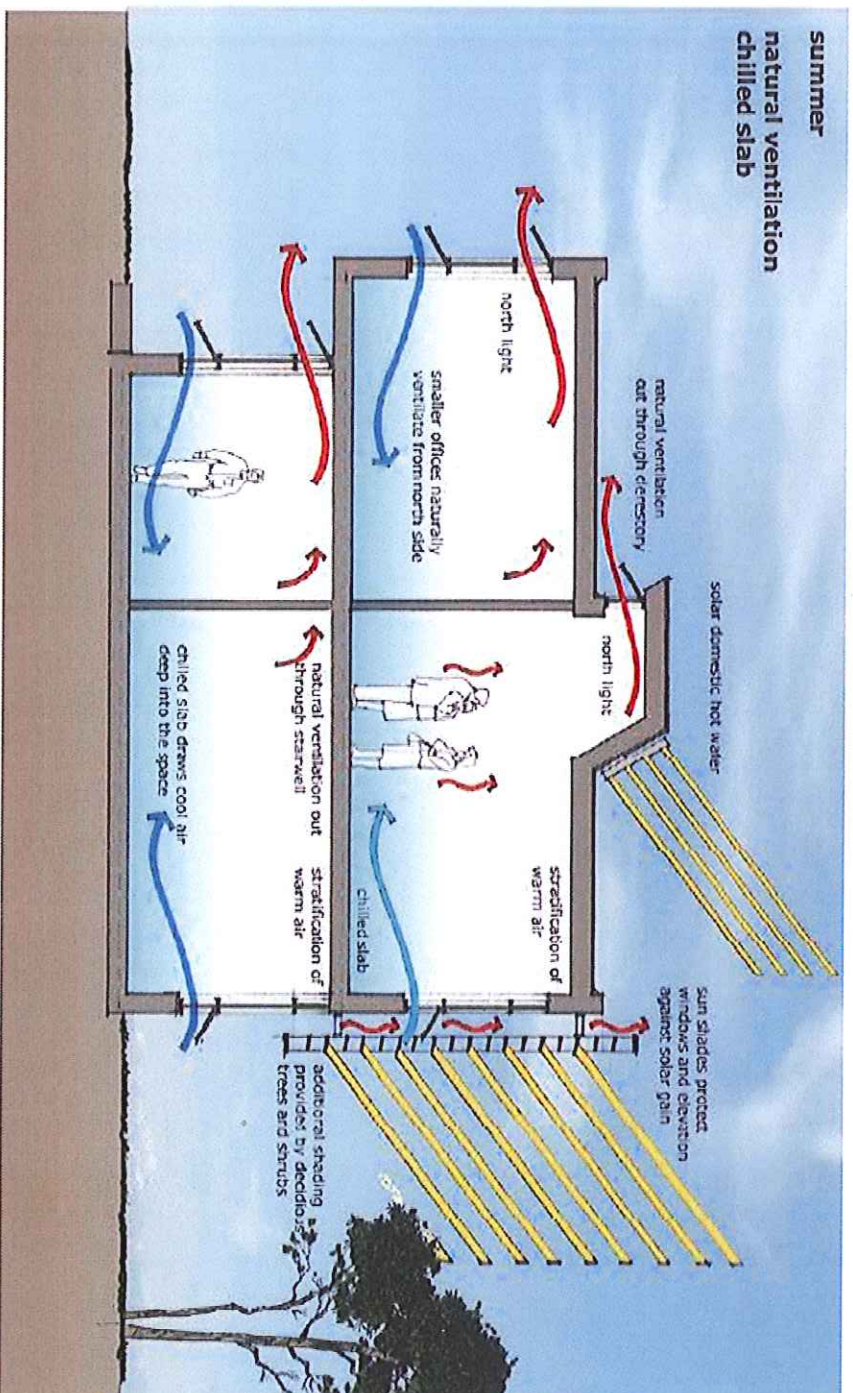




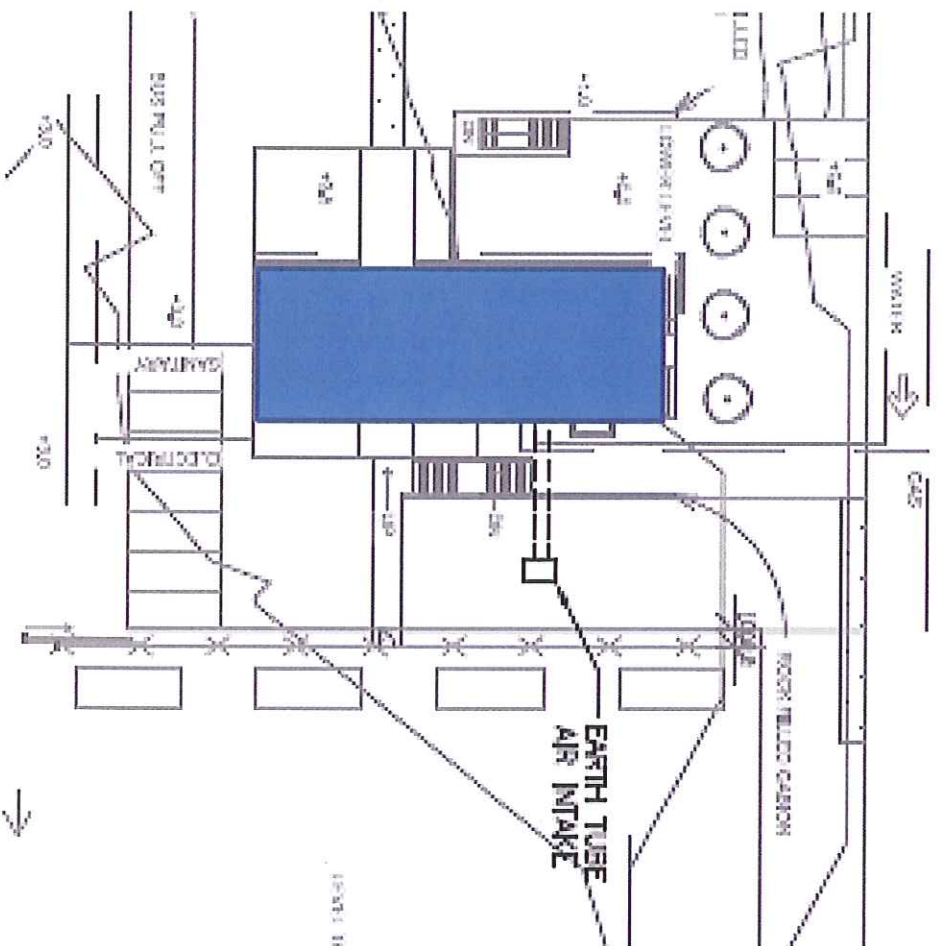
# SUSTAINABLE BUILDING SYSTEMS



# SUSTAINABLE BUILDING SYSTEMS



# EARTH TEMPERED VENTILATION SYSTEM

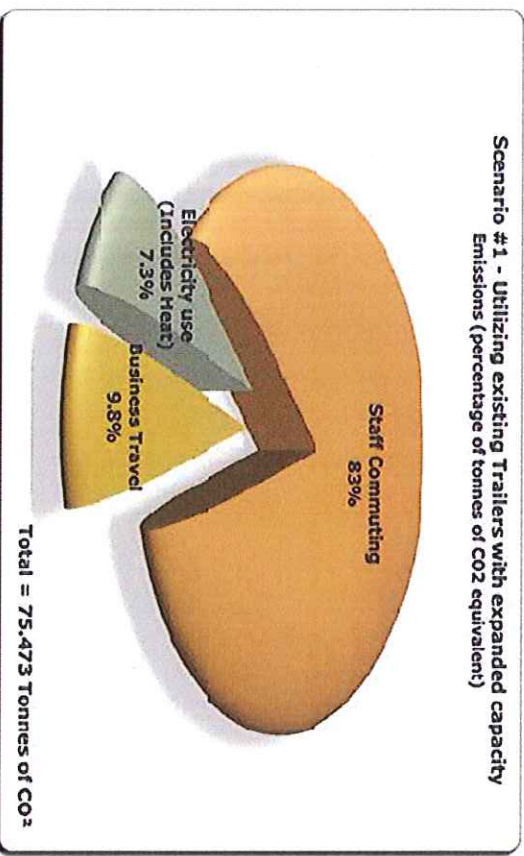


# NORTH PERSPECTIVE: VENTILATION



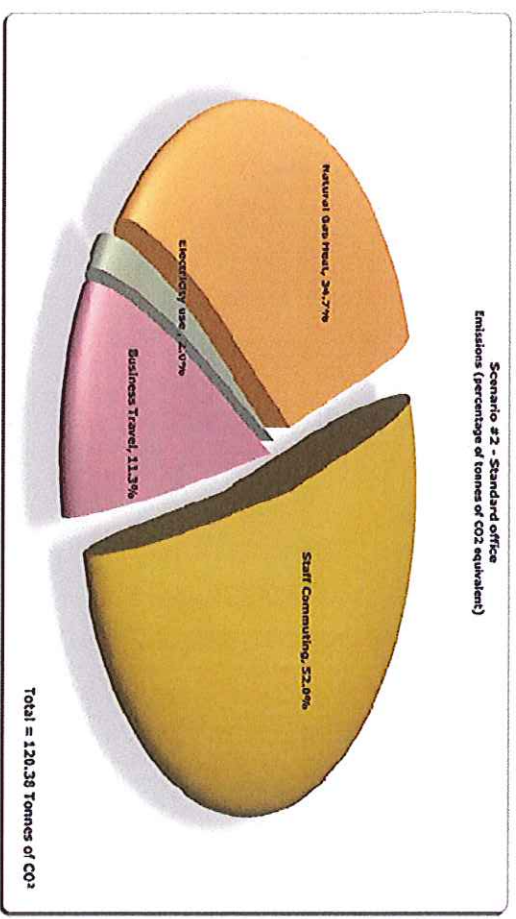
# CARBON FOOTPRINT

## 5.5T CO<sub>2</sub>e Building Footprint



Scenario 1 – Existing trailers increased pro-rata to 730m<sup>2</sup>  
75.5 Tonnes of CO<sub>2</sub>

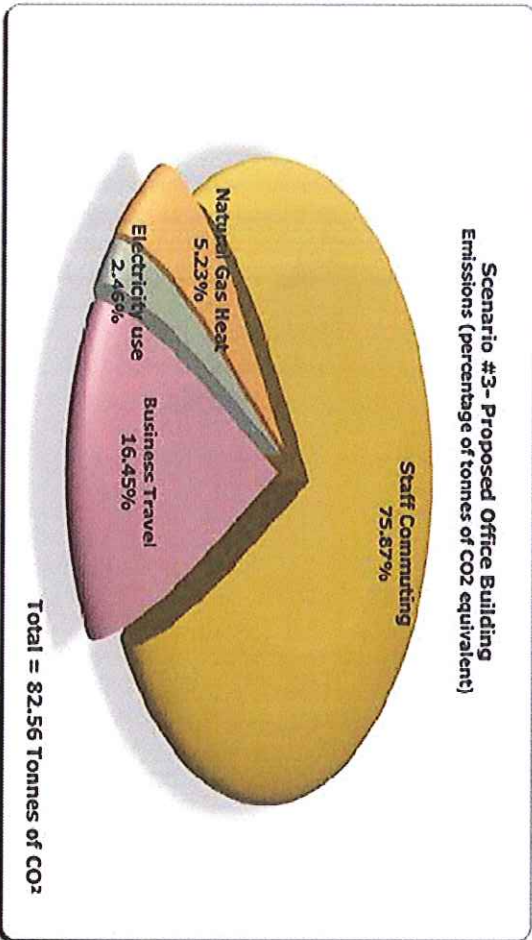
## 44.2T CO<sub>2</sub>e Building Footprint



Scenario 2 – Standard office designed to minimum BC Building Code and ASHRAE 90.1  
120.4 Tonnes of CO<sub>2</sub>

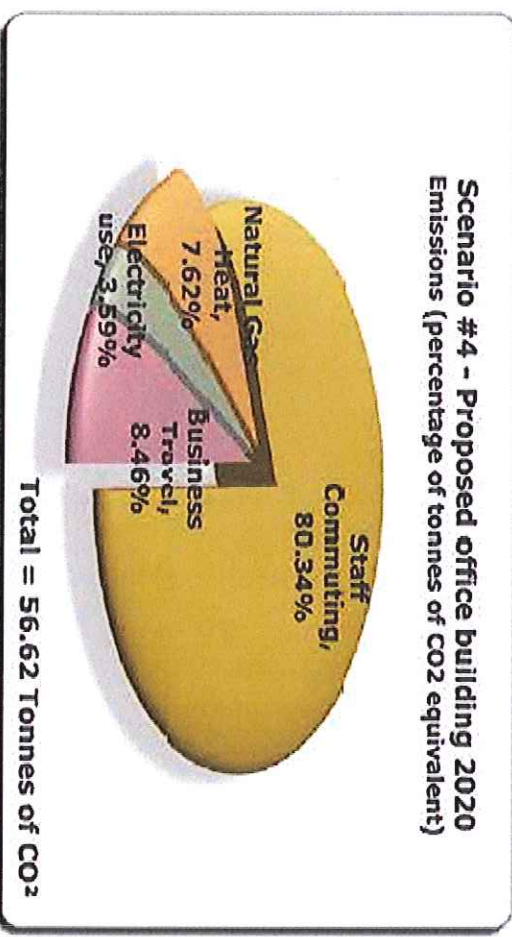
# CARBON FOOTPRINT

## 5.24T CO<sub>2</sub>e Building Footprint



Scenario 3 – Proposed office building including geothermal 82.6 Tonnes of CO<sub>2</sub>

## 6.34T CO<sub>2</sub>e Building Footprint



Scenario 4 – Proposed office building in 2020, with re-commuting 56.6 Tonnes of CO<sub>2</sub>

# ECO-FOOTPRINT: RE-USED MATERIAL

Plastic bottle partition



A partition composed of reclaimed, water-filled and sealed plastic water bottles is proposed for the public meeting area. It will form a highly decorative demonstration of basic principles recycling, that provides thermal mass and sound absorption, while allowing diffuse light to pass through.



# COST COMPARISON WITH WWTP ADMIN FACILITY

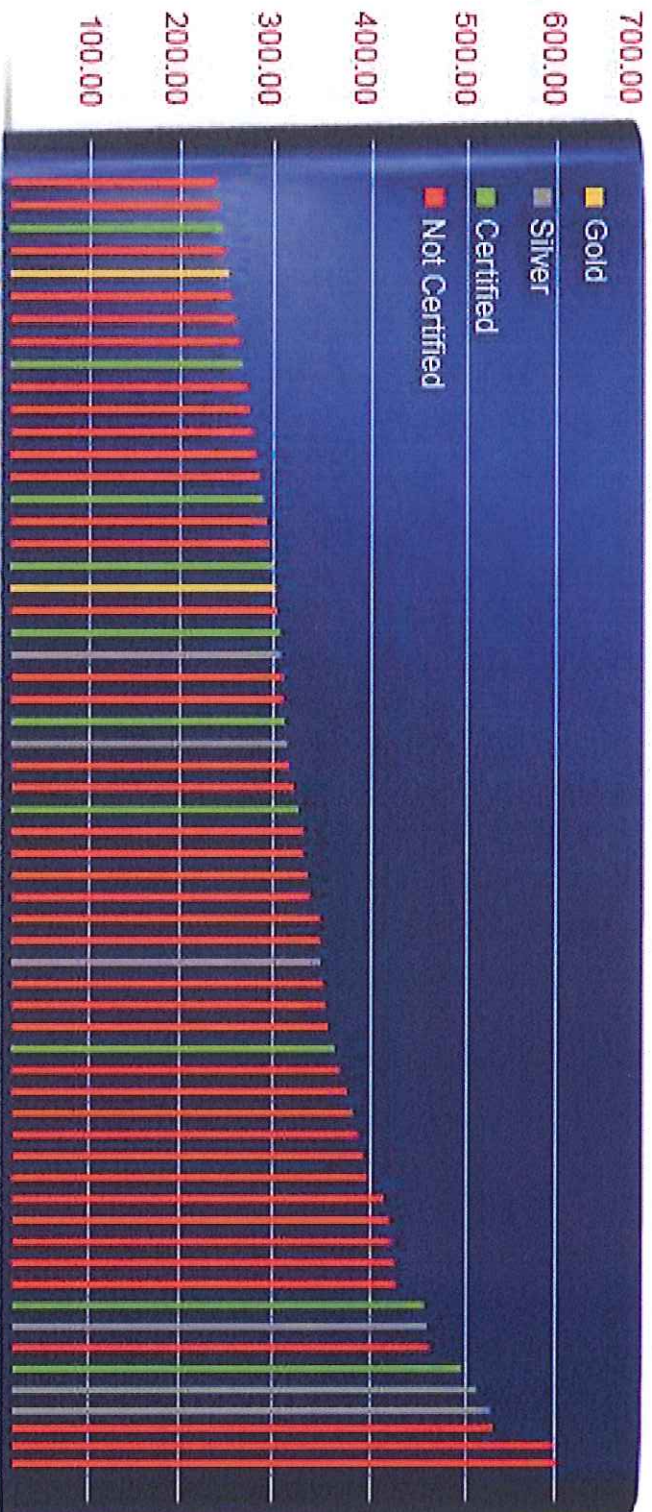
Measure	WWTP	Landfill
Size	12,318 sf	7,858 sf
Staff	25	26
Space/person	493 sf/pers	302 sf/pers
Construction Year	1996	2013
Construction Cost	\$1,800,000	TBD
2011 Est. Value	\$3,750,209	\$2,465,133
Value/sf	\$304.45/sf	\$313.71/sf
O&M	\$55k+utility	\$25.5k+utility





# GREEN VS CONVENTIONAL CAPITAL COST

Academic Buildings  
Cost/SF



Institute for Building Efficiency  
Adopted from David Langdon Adamson 2007

# GREEN BLDG LIFE-CYCLE COST SAVINGS

Category	20-yr NPV/sf
Energy Savings	\$5.79
Emissions Savings	\$1.18
Water Savings	\$0.51
Waste Savings(construction)	\$0.03
Commission'g O&M Savings	\$8.47
Productivity & Health (C-S)	\$36.89
Productivity & Health (G-P)	\$55.33
Less Green Capital Premium	<b>(\$4.00)</b>
Total 20-yr NPV (C-S)	\$48.87
Total 20-yr NPV (G-P)	\$67.31

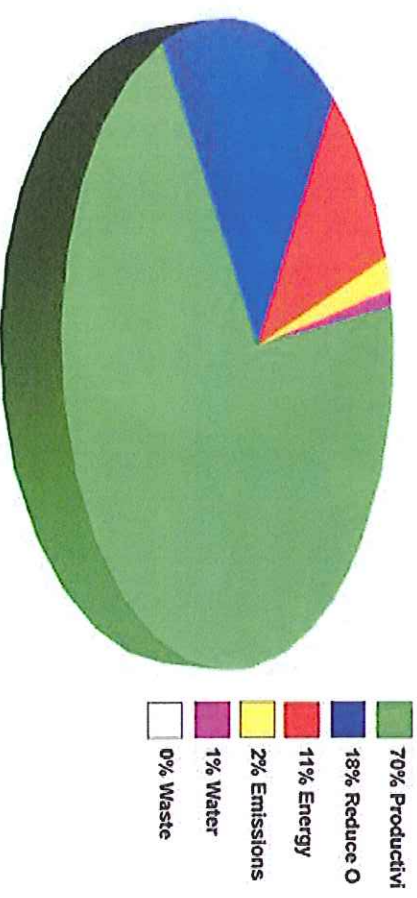
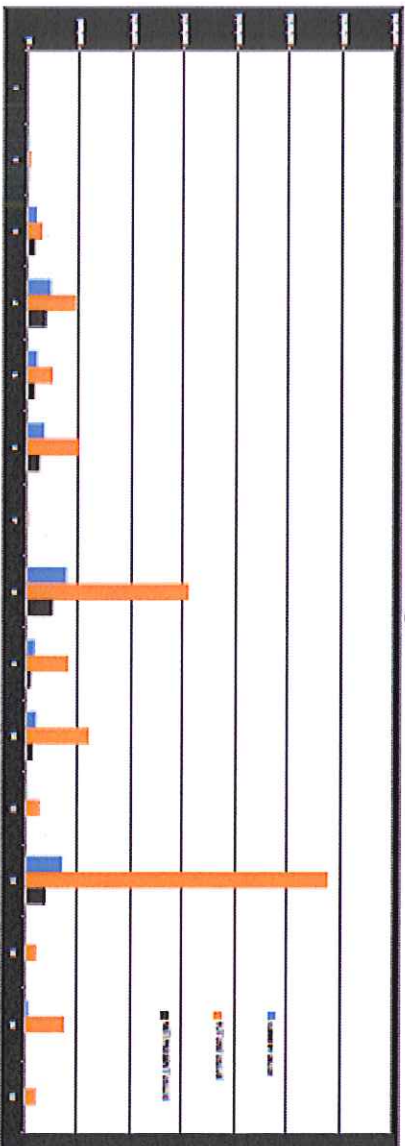


Figure XI-2. Percentage Breakdown of Green Building Financial Benefits (LEED Certified and Silver Buildings)

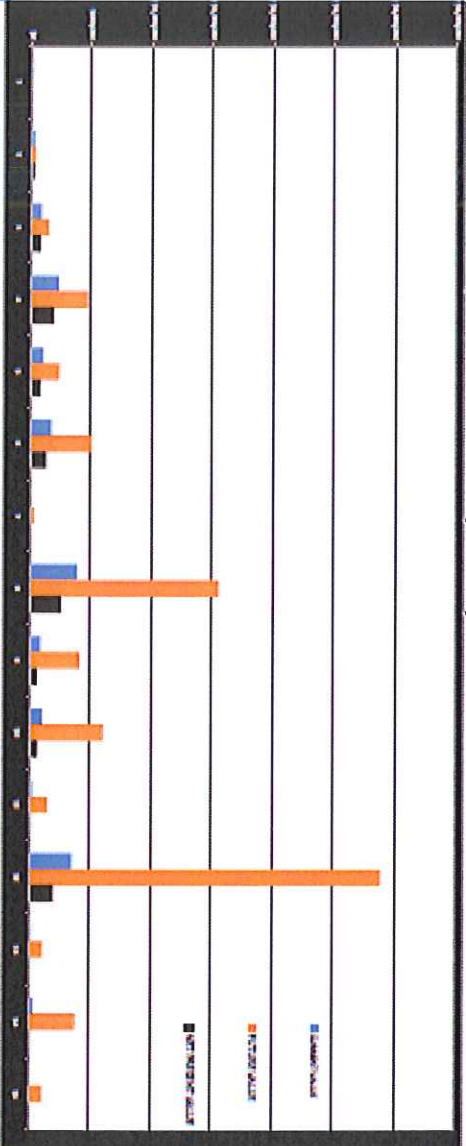
Source: Capital E Analysis

# LIFE CYCLE COST (LCC) COMPARISONS

## Proposed Permanent Building



## Modulars replaced every 25 years



Option	Proposed	Modulars
NPV/sf	\$470	\$452
Energy kWh/yr	243,000	273,658
GHG	6.34T	5.5T

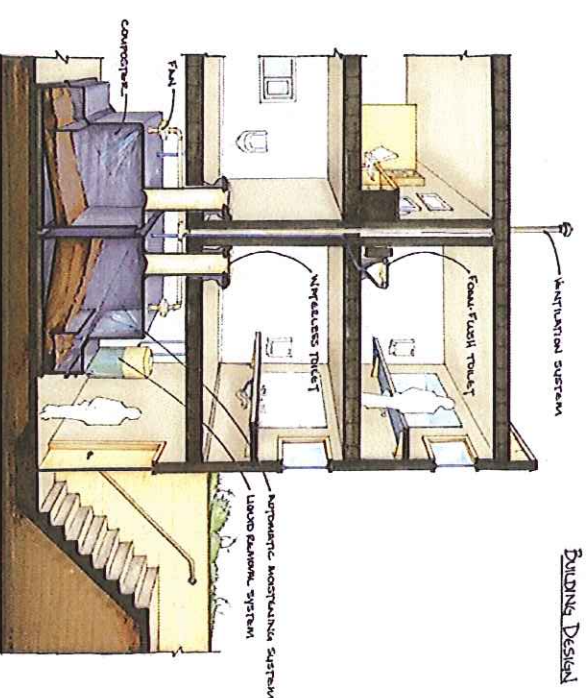
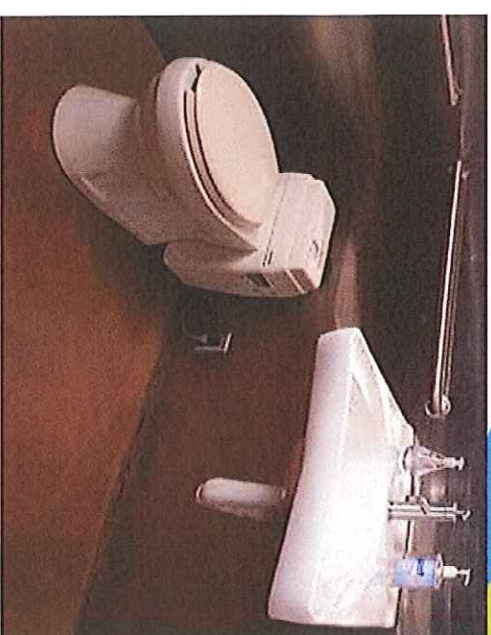
Permanent building 4% more LCC than modulars. Modulars do not comply with ASHRAE HVAC standards.



# WATER UTILIZATION

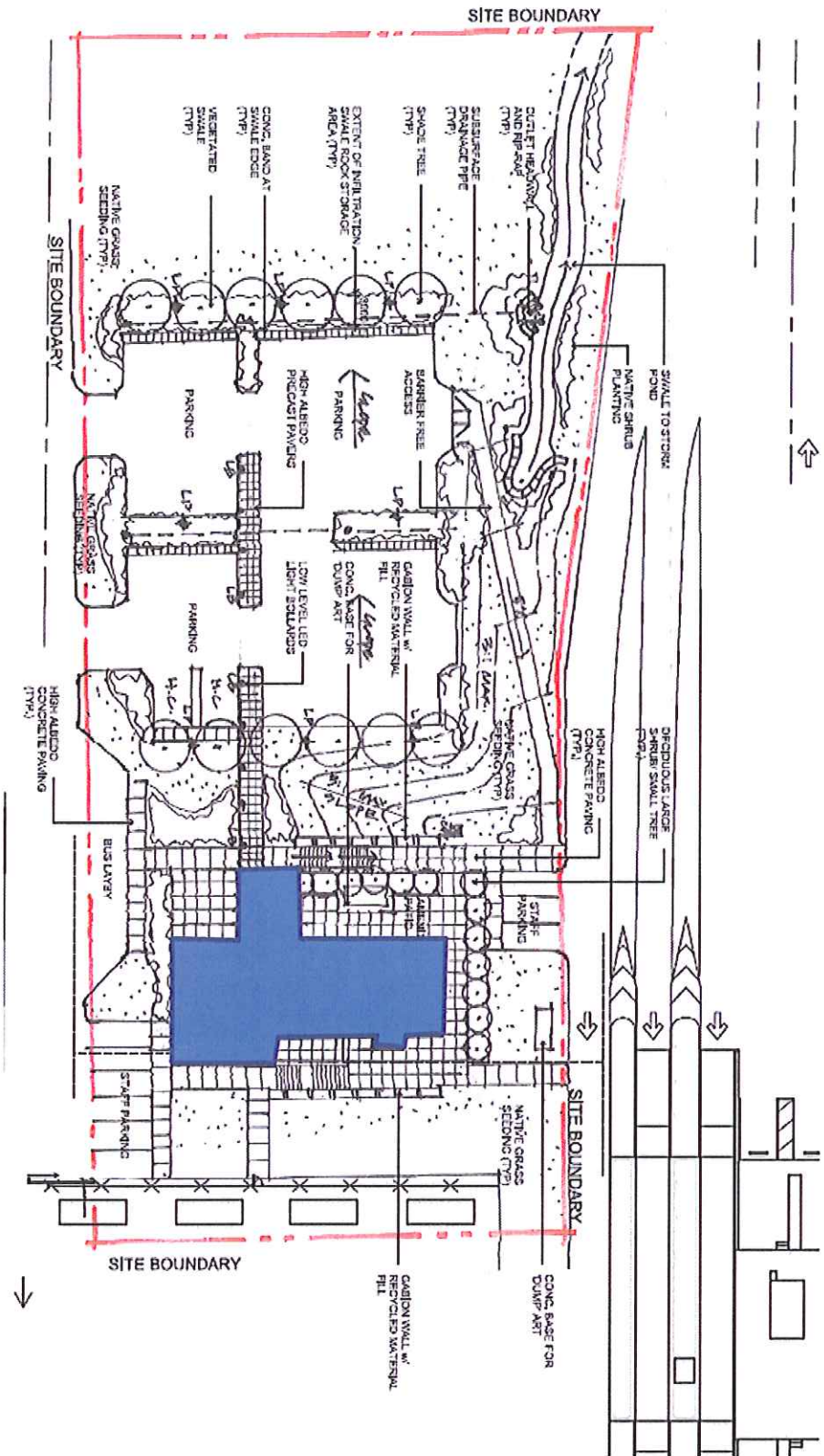
Construction	H2O consumption	Change
Base Case	270,323 l/annum	N/A
Proposed	150,300 l/annum	-44.5%

- Low flow showers, sinks and lavatories and IR controls
- **Re-circulate grey water to leachate recirc system**
- Composting toilets (0.191 l/flush), soil additive
- No impact on treatment facility



*Building Design*

# LANDSCAPE PLAN



# MBL SCORECARD

INDICATOR		STRATEGIES
Natural Capital		
1	Carbon Footprint	Bio-methane is key energy source for building
2	Ecological Footprint	MPB-Kill Pine, recycled flooring and partitions, dump art, future agricultural land
3	Watershed Protection	Composting toilets, leachate recirc, bio-swales
4	Habitat & Biodiversity	Avocets, wildlife corridor
Built Capital		
5	Capital preservation	Optimize life-cycle cost for service life
Economic Capital		
6	Level of Service	Increased functionality wrt current modulars
7	Return on Investment	UBCO research partnership

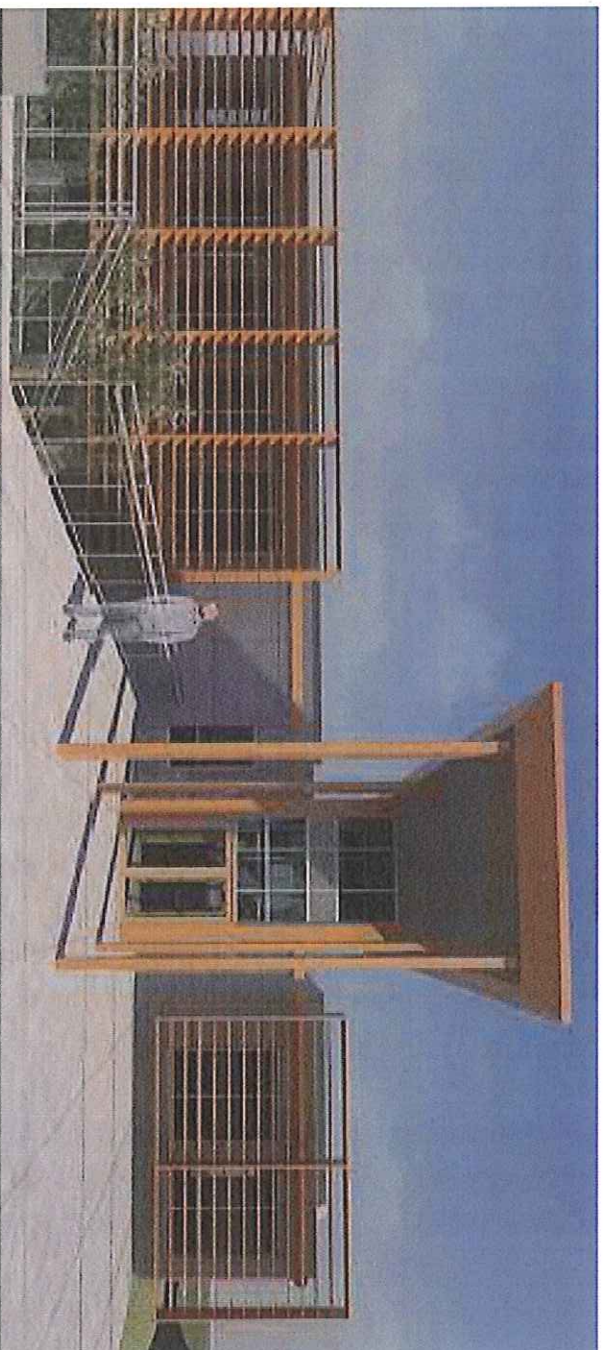
# MBL SCORECARD

INDICATOR	STRATEGIES	
Social Capital		
8	Connectivity, Accessible	John Hindle Drive, Multi-Use Pathway, local service
9	Safety, Security	Intersection improvements, queuing lanes
Cultural/Creative Capital		
10	Distinctive Place	Industrial Ecology Demonstration site
11	Recreat'n/culture venue	Multi-Use Pathway, natural area trail
12	Innovate/Design Quality	Thermal modified timber, high performance
Financial Capital		
13	Life Cycle Cost	4% > modulars, 22% < energy than conventional
14	Capital Reserves	Financial model includes renewal reserves
15	External investments	Wood First Grants & Fortis LFG gas sales



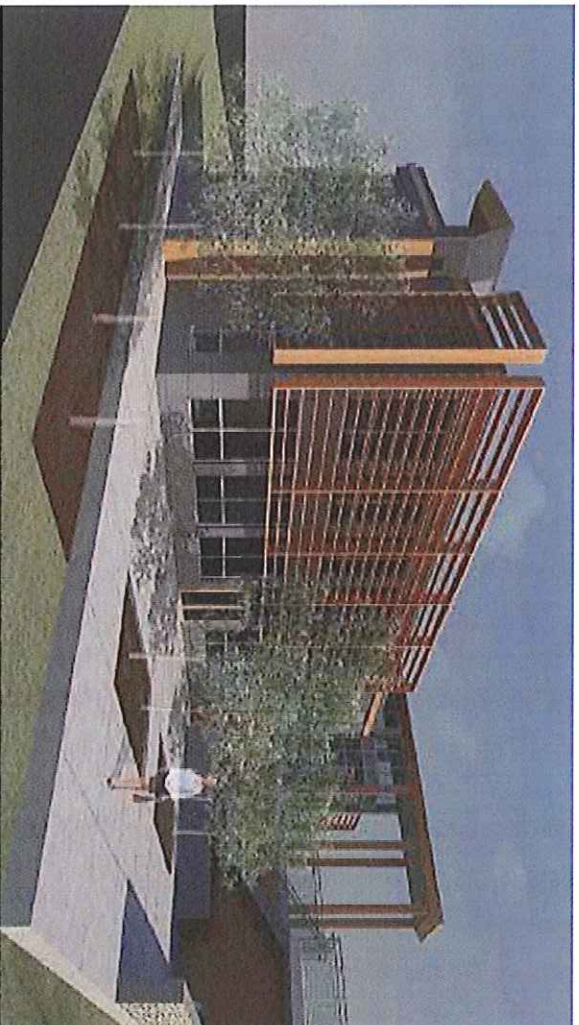
# MBL SCORECARD

INDICATOR		STRATEGIES	
Governance Capital			
16	Public Engagement	Training and Exhibition facility	

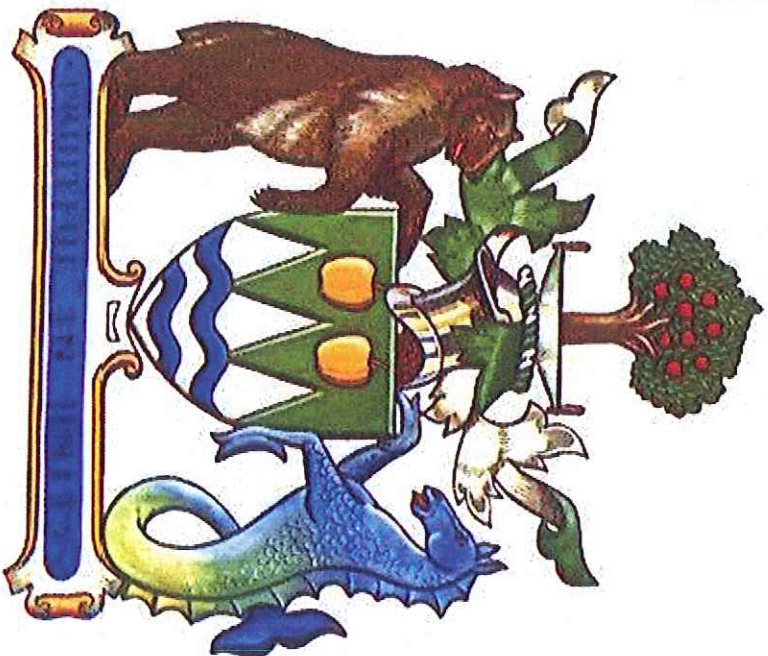
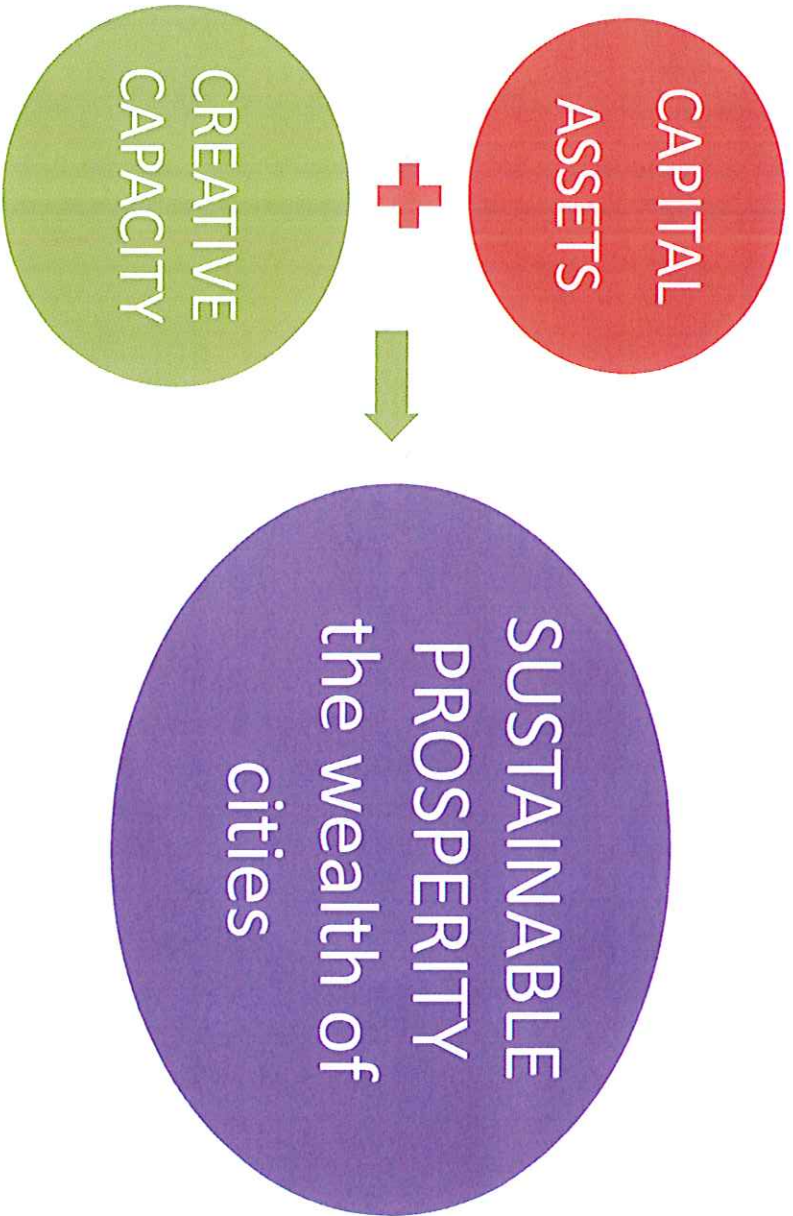
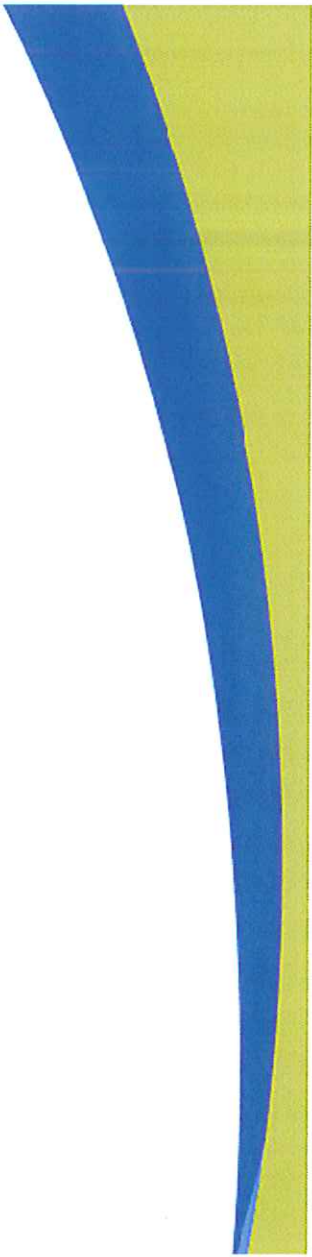


South Entrance Perspective

# QUESTIONS?



Perspective looking north-east from weigh scales



What infrastructure investments might support the **WEALTH** of Kelowna?

Sustainable Municipal Infrastructure:  
Council Policy #352

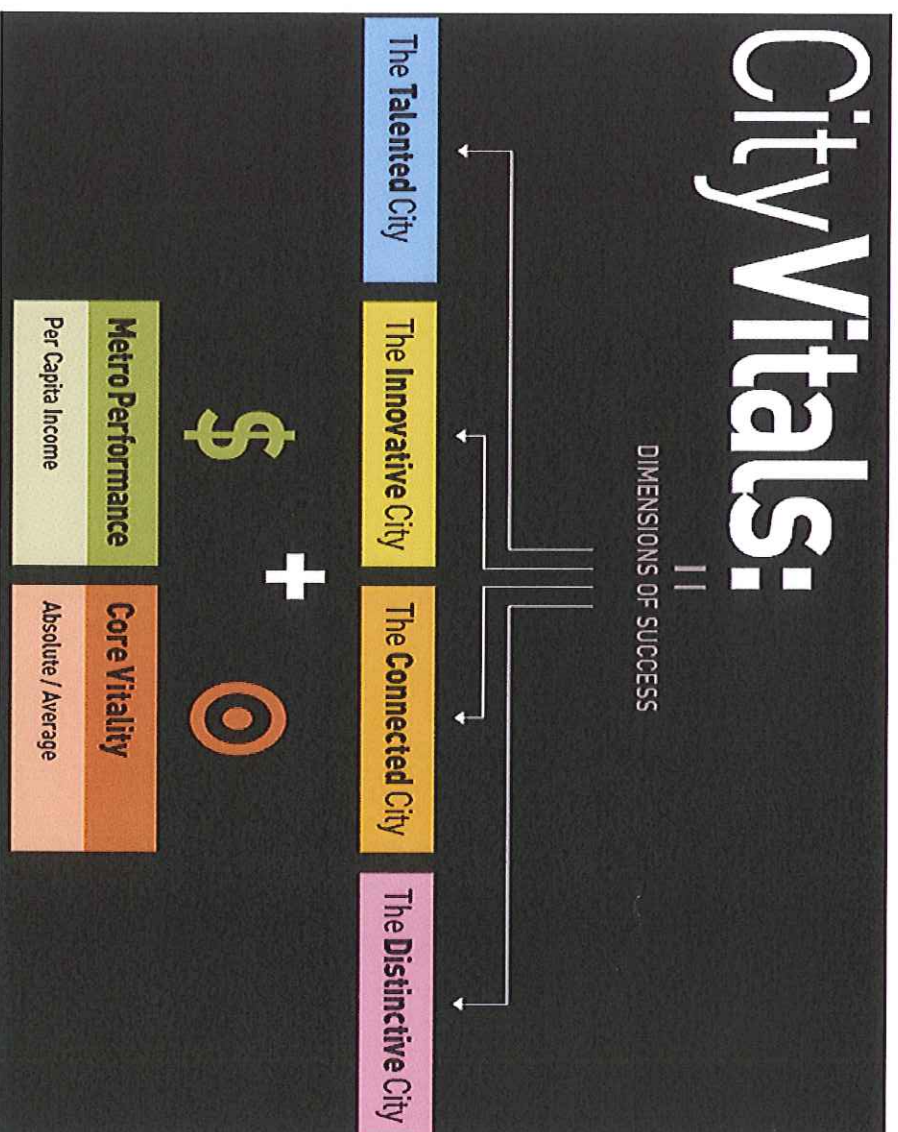
# SUSTAINABLE INCOME: LIVING ON THE INTEREST OF WEALTH

“More urban leaders are now thinking of a city as fields and domains of capital that need to be balanced .... Successful places go out of their way to accumulate all types of capital.” ...C.Landry. 2008. *The Creative City*.

Capital	Elements
Environmental	Natural: Renewable, Replenishable, Non-renewable
Economic	Means of production (technology, techniques)
Built	Construction: residential, industrial, commercial, institutional
Financial	Currency and instruments of exchange, market mechanisms
Human	Talents, skills, special knowledge
Intellectual	Capacity to learn, alternative ways of knowing
Technical	Problem solving theory and application
Social	Civil society relationships, organizations, trust and caring
Cultural	Belonging, sense of place, values
Creativity	Curiosity, imagination, relax into ambiguity, inventiveness
Democratic	Empowerment, Dialogue, Accountability, Transparency
Leadership	Power to inspire shared vision, responsibility, motivation,

# SUSTAINABLE CITIES CAPACITY: GOVERNANCE + CREATIVITY = VITALITY

- Talented City - **TALENT**  
Raleigh/Durham NC  
San Francisco/Oakland/San Jose
- Innovative City - **TOLERANT**  
San Francisco/Oakland/San Jose  
West Palm Beach, CA
- Connected City - **TECHNOLOGY**  
San Francisco/Oakland/San Jose  
Austin, TX
- Distinctive City- **TERRITORIAL ASSETS**  
San Francisco/Oakland/San Jose  
Salt Lake City, UT



Joseph Cortright, CEOs for Cities ([www.ceosforcities.org](http://www.ceosforcities.org))