



# DIMINISHED AND DISMISSED

Submission to CEAA/EAO  
Joint Review Panel  
BC Hydro Site C Clean Energy Project

Environmental Impact Statement (EIS) –  
Potential Project Impact on Agriculture  
January 14, 2014  
Fort St John, B.C., Canada

Prepared for the Peace Valley Environment Association

**Wendy Holm, P.Ag.**

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*Put faith in experts,  
not models...*

*(this is about public interest...)*

Art Guitard, Director. Beaverlodge Research Station  
Beaverlodge, Alberta 1965:

*“...it is a region of exceedingly good productivity. ...There is a broad-based diversified agricultural industry.*

*...climate is extremely favourable. ...favourable distribution of moisture, combined with lower evaporation than in the south, makes efficient moisture use possible. ... the reduction in the growing season is compensated for by increase in day-length.*

*...What must concern us is... the economic forces that may exist in the future to cause this land to be developed improperly...”*

# Wendy Holm, P.Ag.

Professional Agrologist with 40+ years experience  
in **agricultural economics** and **public policy**

BC Agrologist of the Year 2000

Rosemary Davis Award, Farm Credit Canada, 2009

Distinguished Alumni Award, Faculty of Agriculture,  
University of British Columbia, 2008

Queen's Medal 1993, 2002

Farm journalist 20 years – public policy

## ENGAGED BY PEACE RIVER ENVIRONMENT ASSOC TO:

- review and comment on [the EIS guidelines](#) (2012),
- review and comment on BC Hydro's [Environmental Impact Statement](#) ([GAP ANALYSIS](#), spr of 2013),
- conduct a [field visit and meet with area farmers](#) and clients (October 2013),
- undertake [background research and conduct phone interviews](#) with stakeholders,
- prepare a [formal written submission](#) to this Panel and
- [appear before this Panel today](#) to provide evidence and respond to questions.

THE EIS ANALYSIS FAILS TO RECOGNIZE  
THE UNIQUE PROPERTIES OF THE PEACE RIVER VALLEY  
SOILS AND THEIR IMPORTANCE TO FOOD SECURITY

BECAUSE OF THIS,  
IT DOES NOT MEASURE ACCURATELY  
ECONOMIC COSTS ASSOCIATED WITH THEIR LOSS

AS A RESULT,  
THIS PANEL HAS NOT BEEN GIVEN  
SUFFICIENT INFORMATION  
TO UNDERSTAND AND WEIGH THE  
ECONOMIC AND PUBLIC POLICY COSTS  
ARISING FROM THE SITE C DAM...

# TASK AT HAND: TO MEASURE

1. Magnitude of Impact of Dam on Agriculture
2. Cost of this impact (short, medium, long term)  
private landowners  
public Interest
3. Cumulative impact

# CONTEXT: ECONOMIC AND POLICY CONCERNS

## *GLOBAL FORCES PRESSURING FOOD PRICES*

### *Supply*

- **global loss of farmland** (use conversion)
- **water** shortages
- soil **salinization** in supply areas (e.g. Calif.)
- higher **energy costs** (production/manufacturing)
- higher **transportation costs**
- supply chain concentration

### *Demand*

- *Population*



# CONTEXT: ECONOMIC AND POLICY CONCERNS

- **FOOD COSTS: 11.1% OF HOUSEHOLD EXPENSES**
- **BC IMPORTS**
  - 52% of all foods consumed in BC*
  - 44% of foods consumed that can be economically grown BC**
- **FRUITS & VEGETABLES = MOST DEFICIENT CATEGORIES**

**WHAT IS THE OBJECTIVE?**

**RESILIENCE**

can't mitigate forces  
over which you have no control,  
can only mitigate damage arising...

# re•sil•ience

*the ability to become strong, healthy, or successful again  
after something bad happens...*

*Merriam Webster*

## *It's about food...*

The combination of fertile alluvial soils in an east-west valley with Class 1 climate for agriculture are **unique...**

Only such combination north of **Quesnel...**

Have a range of **crop options** equivalent to the **Fraser and Okanagan valleys**, but with higher yields.

The land to be flooded by Site C is capable of producing high yielding **fresh fruits and vegetables for over a million people.**

**Resilience** means keeping our options open...

## GAPS IN EIS ANALYSIS

1. Under-represents the area of impact
2. Under-values private losses
3. Under-values public losses
4. Fails to measure cumulative effects + risks  
*all written off individually as “insignificant”*

## GAPS IN EIS ANALYSIS

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4. Fails to measure cumulative effects + risks  
*all written off individually as “insignificant”*

## *The numbers game...*

SITE C IMPACT:	12,759 ha	31,528 ac
<u>minus impact line areas</u>	<u>-6,290 ha</u>	<u>-15,542 ac</u>
equals LAND LOST	6,469 ha	15,985 ac
minus “low utility” areas*		
<u>Class 6 and 7</u>	<u>-2,653 ha</u>	<u>-6,556 ac</u>
<u>Class 1-5</u>	<u>-2,150 ha</u>	<u>-5,313 ac</u>
LOSS VALUATION (13%)	1,666 ha	4,117 ac

\* all class 6 and 7 land + 60% of class 1-5

**SMARTIES FOR DUMMIES**  
**LAND IMPACTED BY SITE C:**  
**12,759 ha or 31,528 acres**



**CL 1-green CL 2-blue CL 3=mauve**  
**CL 4=pink CL 5=brown CL 6=yellow CL 7=red**

# SMARTIES FOR DUMMIES

MINUS land within impact lines = LAND LOST  
6,469 ha or 15,985 ac



CL 1-green CL 2-blue CL 3=mauve  
CL 4=pink CL 5=brown CL 6=yellow CL 7=red



# SMARTIES FOR DUMMIES

## UTILITY RATINGS

6,469 ha or 15,985 ac



high = blue (CL 1-3) med = brown (CL 4-5) low = orange CL 6-7)

# SMARTIES FOR DUMMIES

## “ADJUSTED” UTILITY RATINGS

6,469 ha – 15,985 ac



high = blue (CL 1-3) med = brown (CL 4-5) low = orange (CL 6-7)

# SMARTIES FOR DUMMIES

MINUS “LOW UTILITY” LAND = LAND LOST (MODEL)

1,666 ha – 4,117 ac



high = blue (CL 1-3)    med = brown (CL 4-5)

**IMPACTED** (12,759 ha or 31,528 acres)



**FLOODED**



**UTILITY CLASSES**

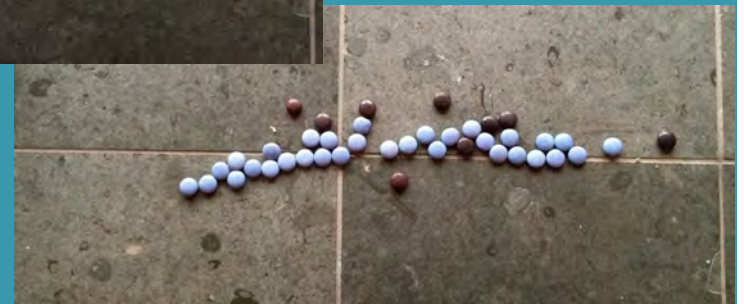


**REVISED  
UTILITY  
CLASSES**



**SMARTIES FOR DUMMIES**

**LOST** 1,666 ha or 4,117 ac



*These REMAINING 1,666 ha (4,177 ac)  
- 13% or ONE IN EIGHT ha/ac IMPACTED -  
are then used as the basis for  
“no-dam” scenario...*

In other words, it is assumed that  
the only land that would have been cultivated  
over the next 100 years  
would have been 1,666 hectares...

# GAPS IN EIS ANALYSIS

1. Under-represents the area of impact
2. Under-values private losses
3. Under-values public losses
4. Fails to measure cumulative effects + risks

## *Mitigation-Compensation*

### **AGRICULTURAL LOSSES – IMPACTED LANDS**

within stability, flood, erosion and landslide-generated wave impact lines

( 6,290 ha, 15,534 ac)

### **AGRICULTURAL LOSSES – FLOODED LANDS**

flooded or used for dam construction, road ways, quarries

(6,469 ha, 15,985 ac)

## *Mitigation-Compensation*

# AGRICULTURAL LOSSES FOR IMPACTED LANDS ( 6,290 ha, 15,534 ac)

BC Hydro will **mitigate** damages within the stability, flood, erosion and landslide-generated wave impact lines...

Mit•i•gate: to cause to become less harsh or hostile: mollify, to make less severe or painful: alleviate. *Merriam Webster*



## *Mitigation-Compensation*

# AGRICULTURAL LOSSES ON IMPACTED LANDS

### TEMPORARY LOSSES

- Traffic management plan
  - Soil management, site restoration, re-vegetation plan
  - Borrow and quarry site reclamation plan
  - Vegetation and invasive plant management plan
- (30 plans; one mentions agriculture; unclear how will apply)

### PERMANENT LOSSES

- Irrigation and drainage improvements (needed on uplands?)
- Shelter belts, water systems, grazing imp, wildlife fencing  
already part of environmental farm plan initiatives
- Topsoil relocation (scale? can't move micro-climate...)
- Inclusion of land within the ALR (not BCH jurisdiction, where?)

## *Mitigation-Compensation*

# AGRICULTURAL LOSSES FOR IMPACTED LANDS

1. No quantification...
2. Treats each impairment as discrete – yet for many, whole > sum of its parts: **CUMULATIVE EFFECT** of:
  - risk of slumping
  - persistent erosion
  - use restrictions shadow
  - farm management restrictions  
(range of crops, irrig/drainage, field and equipment use)
  - restrictions on range use
  - erosion of farming community

**UNDER-VALUES PRIVATE LOSS**

## *Mitigation-Compensation*

# AGRICULTURAL LOSSES – FLOODED LANDS

(6,469 ha, 15,985 ac)

BC Hydro will “**compensate**” private owners for outright loss of land based on current land values... Behind closed doors. (Basically **expropriation**.)

*Ex•pro•pri•ate: action of the state in taking or modifying the property rights of an individual in the exercise of its sovereignty.*

*Merriam Webster*

## *Cumulative effects - Wolterson:*

*“... it will be a **hardship** for a farm family to lose their best land to flooding, but perhaps expropriation monies will help them to adapt.*

*But when you **pile on effects**, such as*

- **fragmentation** of their best hayfield by a highway realignment,*
- **loss of the groundwater spring** they used to use to water their stock*
- increased **nuisance from wildlife or public** trespass,*
- tell them five years down the road that their house needs to be moved,*

*it all becomes a bit too much. One can see how a series of large and small impacts, however individually mitigated or compensated, eventually **become a series of inefficiencies and lingering aggravations that seriously affect the desire and economics of agricultural use...**”.*

# GAPS IN EIS ANALYSIS

1. Under-represents the area of impact
2. Under-values private losses
3. Under-values public losses
4. Fails to measure cumulative effects + risks

WHAT SHOULD  
THE ECONOMIC IMPACT  
ASSESSMENT  
BE LOOKING AT?

*What benefits - to farmers, to the community, to the general public - could this land have generated over the next 100 years?*

Instead, BCH's EIS 100 year model is:

- built on an **impoverished baseline** (shadow of the dam)
- predicts what farmers will plant **based on 526 ha today**
- **caps cultivated land** at 1,666 ha
- fails to consider market **externalities**
  - increases 1 – 2 ha/yr for horticulture
  - omits scenario of robust horticulture development
- further discounts results by using high SDR

**Writes off impact as insignificant...**

## BC Hydro EIS Site C "No Dam" Valuation, 100 years ahead

	<i>BASELINE</i> YEAR ONE (ha)	<i>BASELINE</i> YEAR 100 (ha)	<i>BASELINE</i> YEAR 100 (%)
Vegetables	-	100	2%
Canola	117	339	7%
Grain	90	261	5%
Forage	251	727	14%
Pasture	83	240	5%
<b>Total cultivated</b>	<b>541</b>	<b>1,666</b>	<b>32%</b>
Range	1,183	3,477	68%
Idle	3,419		
<b>TOTAL</b>	<b>5,143</b>	<b>5,143</b>	<b>0%</b>



# BC HYDRO MODEL: GROSS RETURNS PER HA, YRS 1 AND 100 CONSTANT DOLLARS

## YEAR 1

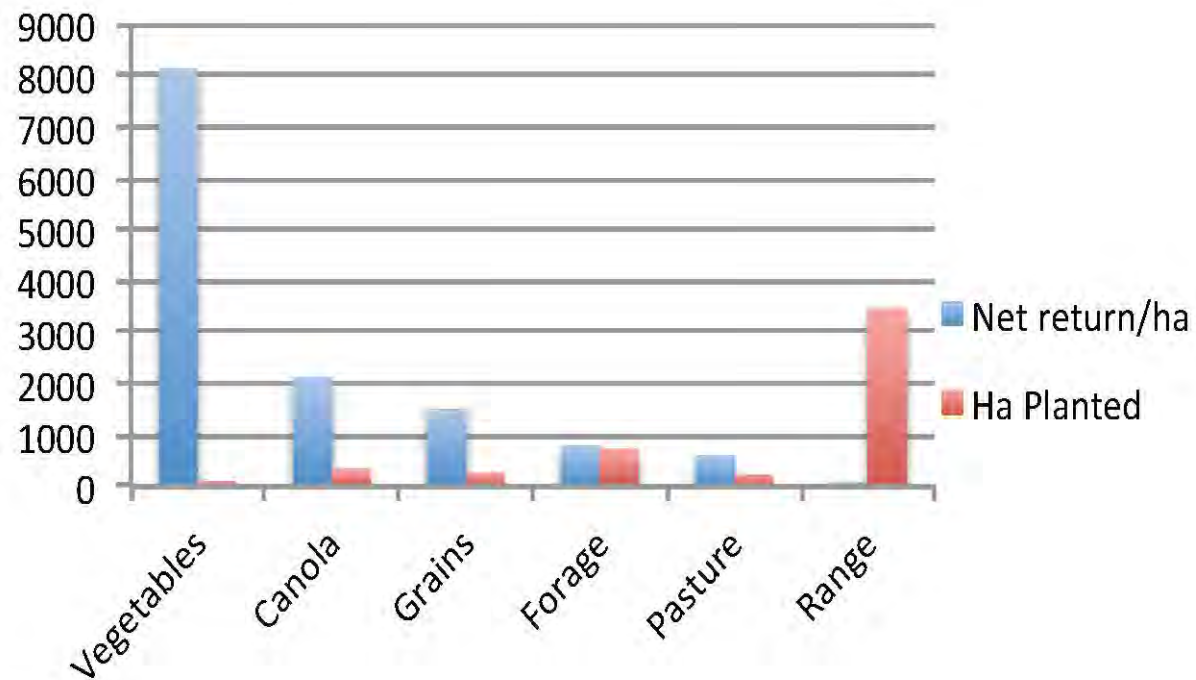
CROP	AREA (ha)	Total Gross Farm Receipts	Total Direct Expenses	Return to Land	Return per ha
Vegetables	0	\$ -	\$ -	\$ -	\$ -
Canoe	117	\$ 150,151	\$ 69,473	\$ 66,010	\$ 1,283.34
Grais	90	\$ 82,134	\$ 40,048	\$ 30,803	\$ 912.60
Forage	251	\$ 120,972	\$ 52,991	\$ 44,419	\$ 481.96
Pasture	83	\$ 30,752	\$ 5,841	\$ 18,882	\$ 370.50
Range	1183	\$ 7,619	\$ 4,093	\$ 3,525	\$ 6.44
Total	1724	\$ 391,627	\$ 172,447	\$ 163,640	\$ 227.16

## YEAR 100

CROP	AREA (ha)	Total Gross Farm Receipts	Total Direct Expenses	Return to Land	Return per ha
Vegetables	100	\$ 813,290	\$ 171,700	\$ 528,390	\$ 8,132.90
Canoe	339	\$ 716,387	\$ 201,295	\$ 472,595	\$ 2,113.24
Grais	261	\$ 392,218	\$ 116,140	\$ 243,359	\$ 1,502.75
Forage	727	\$ 576,968	\$ 153,484	\$ 355,240	\$ 793.63
Pasture	240	\$ 146,422	\$ 16,889	\$ 112,099	\$ 610.09
Range	3477	\$ 36,872	\$ 12,030	\$ 24,842	\$ 10.60
Total	5144	2,682,156	671,538	1,736,525	\$ 521.41

# THE FUTURE ACCORDING TO BCH...

**Returns per Hectare and Area Planted,  
BCH Model, by Crop Type, Year 100**



## SOCIAL DISCOUNT RATE

*BC Hydro: "...The effect of a higher social discount rate is to reduce the cost of not acting now by placing less weight to cost and benefit streams that occur in the future, thereby favouring projects with benefits that occur at earlier dates..."*

# SOCIAL DISCOUNT RATE

MODEL USES DISCOUNT RATE OF:

3.50% yr 1 – 50

2.25% yr 51-100

**1.40% yr is more appropriate for public goods**

*...ethical SDR's are needed to account for irreversible impacts that the current generation may create for future generations and to apply intergenerational equity; that a rate of 1.4% is required to avoid global economic disaster.*

*Stern: Review on the Economics of Carbon Credits*

# SOCIAL DISCOUNT RATE

## IMPLICATIONS OF USING HIGH SDR?

BC Hydro's already impoverished assessment of 100 year public benefits under a no-dam scenario are **further discounted.**

## SUMMARY: MEASURE OF ECONOMIC LOSS?

1. Took **an impoverished snapshot**  
Shadow of the dam
2. Plugged it into a static (“**wooden**”) model  
Today predicts tomorrow
3. Fails to consider **external risks**  
Food price inflation and import dependence
4. Dramatically **undervalued** future economic potential of this uniquely capable land

## AS A RESULT:

- Economic valuation of land loss:  
**written off as insignificant.**
- Economic valuation of secondary economic activity (built on an impoverished model):  
**written off as insignificant.**
- Economic impact of employment (assumed at several jobs a year):  
**written off as insignificant.**

WHAT THEY SHOULD HAVE DONE...  
*(good economic modeling...)*



# GOOD ECONOMIC MODELING:

√ an•tic•i•pate

to foresee and assess  
the implications of risks...

# GOOD ECONOMIC POLICY MODELING:

## 1. ASSESS EXTERNAL MARKET ENVIRONMENT

### *DRIVERS OF GLOBAL FOOD PRICES*

#### *Supply*

- global **loss of farmland** (use conversion)
- **water shortages**
- soil **salinization** in supply areas (e.g. Calif.)
- higher **energy costs**  
(production/ manufacturing, transportation)
- supply chain **concentration**

#### *Demand*

- **population**

***SIDEBAR: FOR EXAMPLE: Diminishing farmland... CALIFORNIA***

*Since 1990, urban development has consumed an acre of land for every 9.4 people statewide.*

*Additional land has been removed from agriculture for environmental purposes... water shortages.*

*Between 2004 and 2006 alone, irrigated farmland declined by more than 200,000 acres statewide ....*

*Unless issues related to the impact of irrigation on the Delta are resolved, there is a significant risk much more farmland will be permanently lost to agriculture or, at least, to irrigated crop production..."*

## **SIDEBAR: FOR EXAMPLE: Diminishing farmland... CANADA**

### **GLOBAL FARMLAND GRAB**

45 mil ha of large scale holdings changed hands 2009  
1998-2008 average= 4 million ha/yr

**TEN FOLD INCREASE**

World Bank Fall 2010 Report

**120 funds** with \$100 billion global capital target  
farmland in 2010

TODAY'S TARGET? **Canada** and Australia:  
good infrastructure, good government,  
good farmland and low land prices (2010):  
Canadian Prairies= \$1,725/ha  
England = \$17,000/ha  
Australia = \$3,450/ha



Globe and Mail, Aug 19, 2009

*“Cheap Canadian Farmland lures foreign buyers*

# GOOD ECONOMIC POLICY MODELING:

2. CONSIDER ECONOMIC IMPLICATIONS OF GLOBAL FOOD INFLATION ON *DOMESTIC FOOD PRICES*:

- Northern half of province
- NWT And Yukon
- Lower Mainland and Vancouver Island

3. DEVELOP *SCENARIOS* TO MEASURE THE ECONOMIC VALUE OF A ROBUST HORTICULTURE SECTOR DEVELOPING ON THE SITE C LANDS IN RESPONSE TO THE ABOVE.

There are lots of energy  
sources, but  
only fruits and vegetables  
are fruits and vegetables....



BC Hydro's assertions on the impact of the  
project on food self-reliance  
*(“not significant”)*  
are simplistic...

*“...For food products that are capable of being grown in  
the Peace Agricultural Region, such as grains, oilseeds  
and beef, the current level of self-reliance is several  
fold in excess of *regional* requirements.*

## *only fruits and vegetables are fruits and vegetables....*

1. BC's greatest food self-reliance deficit is **fresh fruit and vegetables**.
2. **BC imports 57% of fresh fruits and vegetables** consumed in this province that could be grown in this province.
3. Fresh fruits and vegetables are the **most important component of human nutrition**.
4. The alluvial soils and class 1 climate of BC's Peace River farmland give it the capacity **provide fresh vegetables to over 1 million people...**



# THE CASE FOR VEGETABLE PRODUCTION:

Peace River Valley can produce **all the vegetable crops grown in the Fraser Valley and imported from California and Mexico, including:**

early and late maturing **corn,**

**berries** (raspberries are indigenous)

heat loving crops (**beans, cucumber, eggplant, peppers, tomatoes, squash, melons, okra**)

cool hardy crops (**celery, onions, broccoli, cauliflower, cress, lettuce**)

cold tolerant crops (**garlic, leeks, mustard greens, kale, radish, spinach, chard, parsley, herbs, cabbage kohlrabi, Brussel sprouts, kale**) and

root crops (including **parsnips, carrots, potatoes, rutabagas, turnips, beets**)

The valley also supports the production of grains to support a healthy livestock sector, including:

**Cereal grains**

**Wheat**

**Winter wheat**

**Barley**

**Fall rye**

**Flax**

**Rapeseed (canola)**



A 1980 Vegetable Study (commissioned by BC Hydro) identified 1,788 hectares of alluvial soils within the Site C project area that would support fresh vegetable production.

Cropped to vegetables for the fresh market, this would - according to the vegetable study – be sufficient to meet the nutritional requirements of a population of **1,082,896 people.**



In rebuttal, BC Hydro notes:

*“...the reality is that widespread commercial vegetable farming in the PRRD is not economical at this point in time.”*

What is  
“economic at this point in time”  
is not the point....

## SHOULD HAVE INCLUDED SCENARIOS THAT MODEL NEW ECONOMIC OPPORTUNITIES FOR HORTICULTURE

### MODERATELY ROBUST:

Food crisis year 15, +84 hectares that year,  
+20 hectares/year to a total of 883 ha in year 50.  
Economic multiplier rises in year 25 to 2.2\*

### ROBUST

Same as above, but  
+100 hectares/year to a total of 2000 ha in year 35.  
Economic multiplier rises in year 25 to 2.2\*

\* *Carleton University Centre for Trade and Policy Law*

## ***IN FACT, economic activity over next 100 years***

- Triples with moderate horticulture modeling
- increases 7 - 9 times with robust horticulture modeling
- Increases by 20% when 2.2 multiplier used fm yr 25 on

### TOTAL SALES, EXPENSES, RETURNS OVER 100 YEARS

	<b>BCH Baseline</b>	<b>Mod Robust Horticulture</b>	<b>Robust Horticulture</b>
	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>
<b>PRIMARY Economic Activity</b>			
Farm Gate Sales	139.2	474.1	1,277.1
Expenses	42.6	124.2	329.9
Return to the Land	79.9	275.7	738.6
<b>SECONDARY Economic Activity</b>			
Multiplier = 1.8	76.7	223.6	593.9
Multiplier = 2.2 in yr 25		270.1	720.1

## ***IN FACT, Net Present Value today of 100 years activity***

- doubles with 1.4 social discount rate
- increases 5-6 times mod robust horticulture modeling
- increases 13-17 times robust horticulture modeling

### NET PRESENT VALUE OF 100 YEARS OF ECONOMIC ACTIVITY

	BCH Baseline	Using 1.4 SRD	Mod Robust Horticulture	Robust Horticulture
	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>
Farm Gate Sales	30.9	60.5	197.7	542.4
Expenses	10.4	19.6	54.2	145.7
Return to the Land	22.3	33.3	111.6	305.2
Secondary Economic Activity				
Multiplier = 1.8		35.4	97.6	262.3
Multiplier = 2.2 in yr 25			116.7	433.4

# GAPS IN EIS ANALYSIS

1. Under-represents the area of impact
2. Under-values private losses
3. Under-values public losses
4. Fails to measure cumulative effects + risks

Agricultural Impact

was

first diminished,

and then dismissed...



## Economic loss to agriculture:

Gross farm receipts yr 100: \$2,682,000\*

NPV yr 1-100: \$13 - \$36 million

“INSIGNIFICANT...”

## Foregone Secondary Activity:

\$1.2 mill in yr 100

“INSIGNIFICANT...”

## Job Creation:

3-4 FTE's in yr 100 (!)

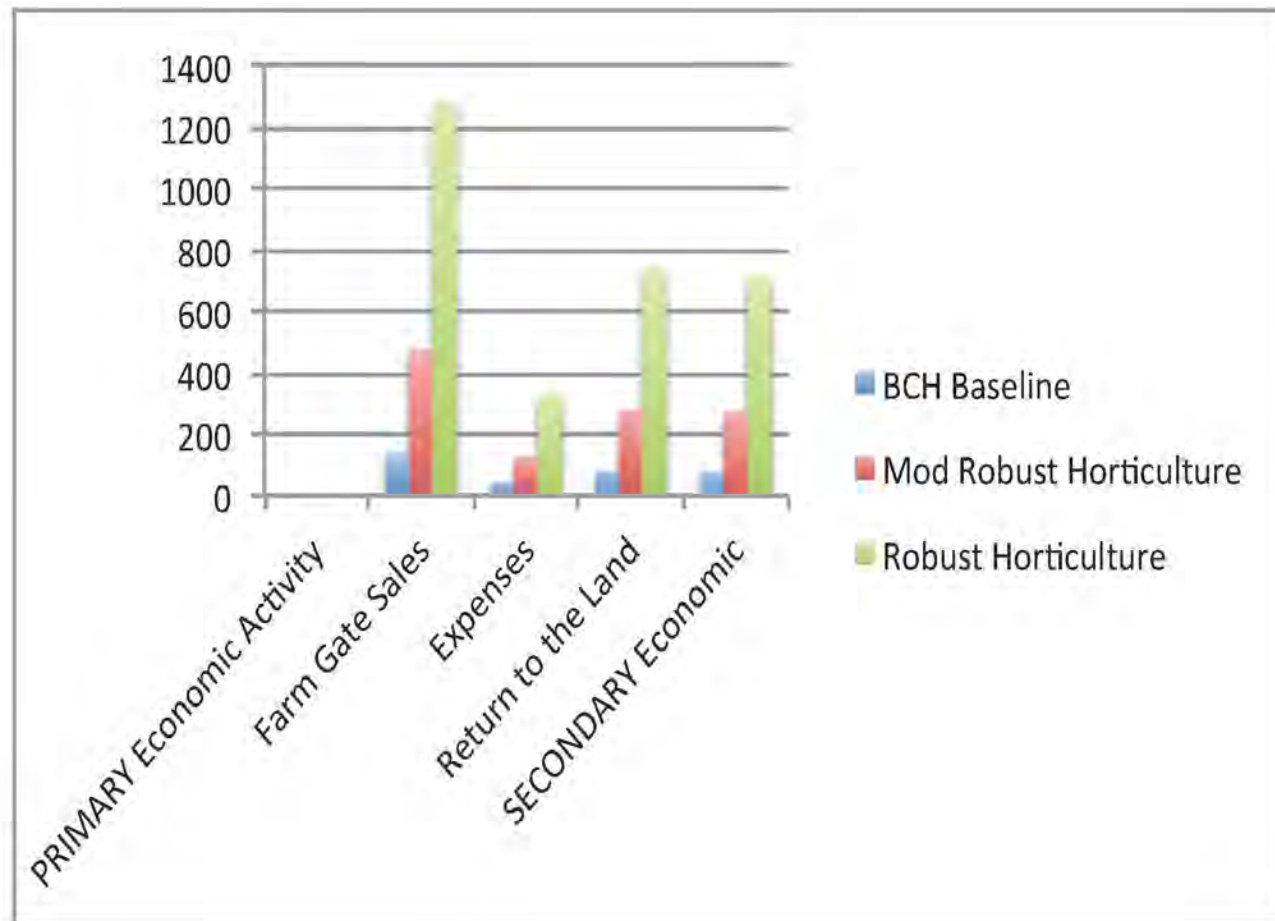
“INSIGNIFICANT...”

\* *This was reported in error in EIS Table 20.34 as 1,628,000.*

## ADDING UP THE NUMBERS = TOTAL ECONOMIC ACTIVITY

	BCH Baseline	Mod Robust Horticulture	Robust Horticulture
	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>
Total Farm Gate Sales (100 years)	\$ 139.2	\$ 474.1	\$ 1,277.1
Secondary Economic Activity (100 years)			
Multiplier = 1.8	\$ 76.7		
Multiplier = 2.2 in yr 25		\$ 270.1	\$ 720.1
<b>TOTAL ECONOMIC ACTIVITY</b>	<b>\$ 215.9</b>	<b>\$ 744.2</b>	<b>\$ 1,997.2</b>

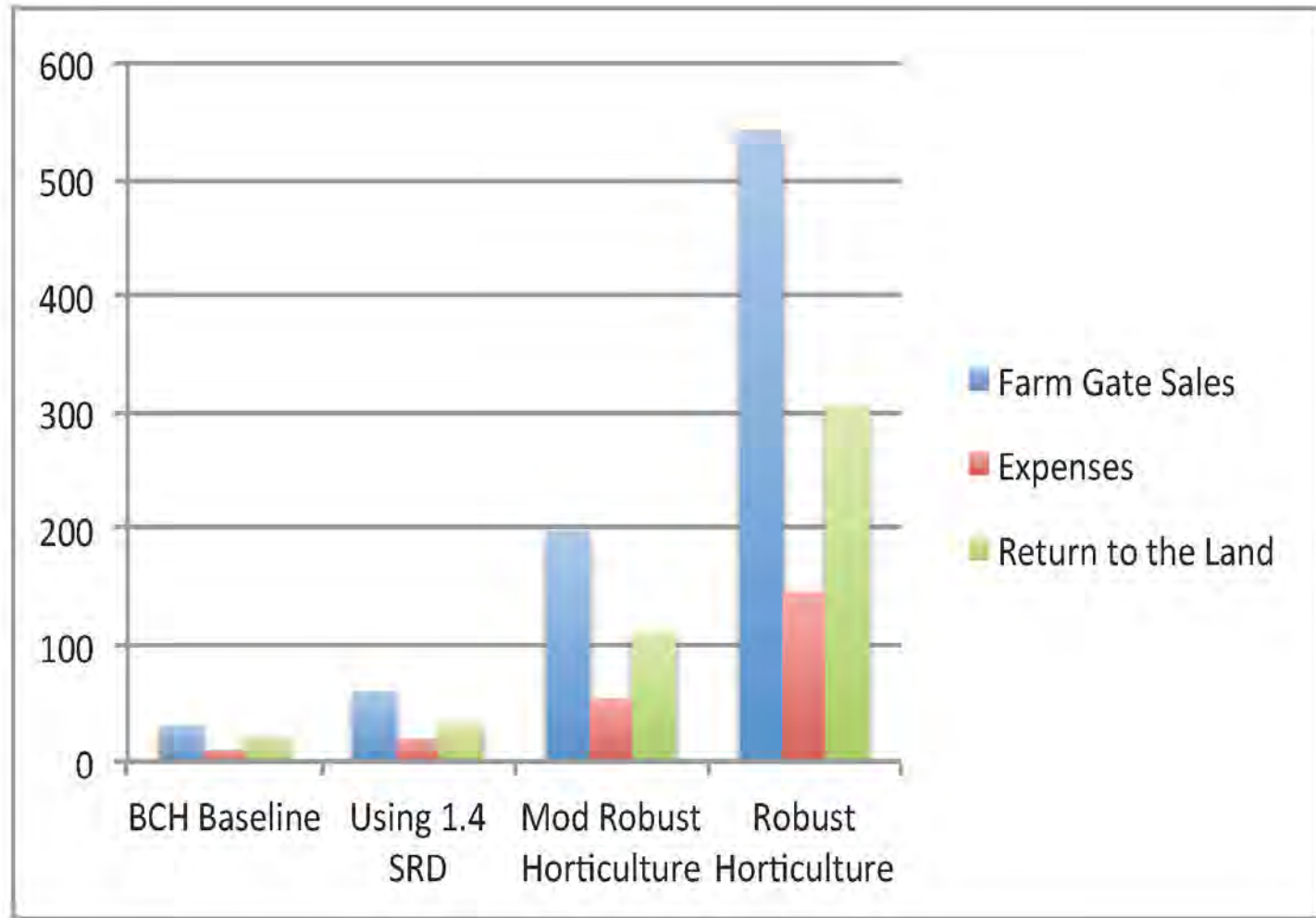
# TOTAL CASH FLOW (mil \$) DIFFERENT SCENARIOS



## ADDING UP THE NUMBERS = NET PRESENT VALUE

	BCH Baseline	Using 1.4 SRD	Mod Robust Horticulture	Robust Horticulture
	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>	<i>mil CAD, Yr 1 \$</i>
Farm Gate Sales	30.9	60.5	197.7	542.4
Expenses	10.4	19.6	54.2	145.7
Return to the Land	22.3	33.3	111.6	305.2
Secondary Economic Activity				
Multiplier = 1.8		35.4		
Multiplier = 2.2 in yr 25			116.7	433.4
<b>RETURN TO NATURAL CAPITAL</b>	<b>\$ 22.3</b>	<b>\$ 68.7</b>	<b>\$ 228.3</b>	<b>\$ 738.6</b>

# NET PRESENT VALUE (mil \$) DIFFERING SCENARIOS



Economic policy analysis must also evaluate the losses rising from *reduced resilience...*

If we flood these lands, and *can't moderate effects of global food shortages with domestic production,*  
how will this impact:

- *disposable household income + child poverty?*
- *family nutrition, nutrition of elderly and young?*
- *community health and well being?*
- *medical costs?*

*Not just for Peace River, but for northern communities and, indeed, rest of province...*

# THE NUMBERS GAME...

These are not *“the numbers”* (value of economic loss...)

Provided only to **demonstrate the impact** of **appropriate** discount rates and more robust economic scenarios on BC HYDRO's MODEL...

*only 1,666 ha, real food prices + only 0.5%/yr*

In fact, **an appropriate model** to measure the loss of these foodlands would look quite different...

*an appropriate model* would include:

1. Valuation of cumulative losses on **100% land impacted**, not 13%...
2. Scenarios in the model that contemplate a robust **and diversified farming sector** that includes dairy and beef.
2. A robust **secondary infrastructure** sector.
3. Quantification of **the socio-economic benefits of resiliency** – in this case, affordable local food - on household income, nutrition, health and medical costs.



# THE KEYWORD

(and economic policy challenge)

√ *re•sil•ience*

...reducing risk to community security and well being means taking actions now to **preserve options** for the future...

# B.C.'s Climate Change Action Plan

Identifies *Strengthening sector resilience* as  
*“the first Adaptation Goal”*

Defines *resilience* as *the amount of change a system can undergo, or the amount of disturbance it can absorb, and still be able to retain the same function, services, structure and feedbacks. Sustainably.*

*“...As populations increase and fossil fuels deplete, **food shortages** will become a problem not only for “poor” nations but for “rich nations” as well.*

*As today’s affordable food becomes tomorrow’s economically rationed resource, communities with no farmland will be the clear losers as the new game of “**find the food**” spins out of control in a wildly cycling global economy.*

*Those who can pay the most will. Those who cannot will go hungry....”*

Wendy Holm, Submission to CEEA/EAO Joint Review Panel, BC Hydro Site C Clean Energy Project, Environmental Impact Statement (EIS) – Potential Project Impact on Agriculture (Economic)

*in defense of food...*

As a province, we **have one option** – grow it or import it.

*There are many sources of energy.*

*Only fruits and vegetables are fruits and vegetables...*

Leaving food prices to global forces invites **food poverty** and all of its attendant economic and social costs.

The **Natural Capital** held in the alluvial soils and Class 1 climate of the Peace River Valley is trans-generational...

*it is not for us to withdraw...*

**THANK YOU...**



**IMPACTED** (12,759 ha or 31,528 acres)



**FLOODED**



**UTILITY CLASSES**



**REVISED  
UTILITY  
CLASSES**



**SMARTIES FOR DUMMIES**

**LOST** 1,666 ha or 4,117 ac

