



Update - 'Namgis First Nation's **KUTERRA** Project

Chief Bill Cranmer - 'Namgis First Nation

Eric Hobson

President - SOS Marine Conservation Foundation & KUTERRA Vice Chair





Working to Catalyze Change

*Goal is to make a **positive environmental difference** and create **socio-economic opportunity** for the 'Namqis First Nation – the People of the Salmon.*



February 18, 2013 – Blessing Ceremony



Social and Environmental Initiatives

- Motivated by concerns about the health of wild salmon upon which the 'Namgis have depended for 6,000 years.
- 100% 'Namgis owned, creating economic and social opportunity for the Nation.
- Professional jobs and training opportunities for First Nations.
- Share knowledge to catalyze change in the industry and create greater environmental good – for the wild salmon and all that depends on them.





Who Is Involved?

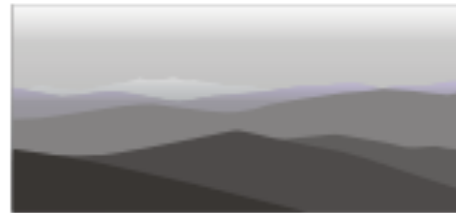
- **'Namgis First Nation** - 100% owner.
- **The SOS Marine Conservation Foundation** (Save Our Salmon) – Project Partner providing funding and business expertise.
- **Tides Canada** - through the Salmon Aquaculture Innovation Fund provides funding, project management support, and technical support through the *Conservation Fund's Freshwater Institute*. Funds Independent Environmental Monitoring through the *Pacific Salmon Foundation*.



TIDEScanada
uncommon solutions for the common good



Funding – Construction & Operations



Fisheries and Oceans
Canada

Pêches et Océans
Canada

- Ritchie Foundation





Project Location



- 5 km south of Port McNeill
- 'Namgis First Nation Land
- Northern Vancouver Island, British Columbia

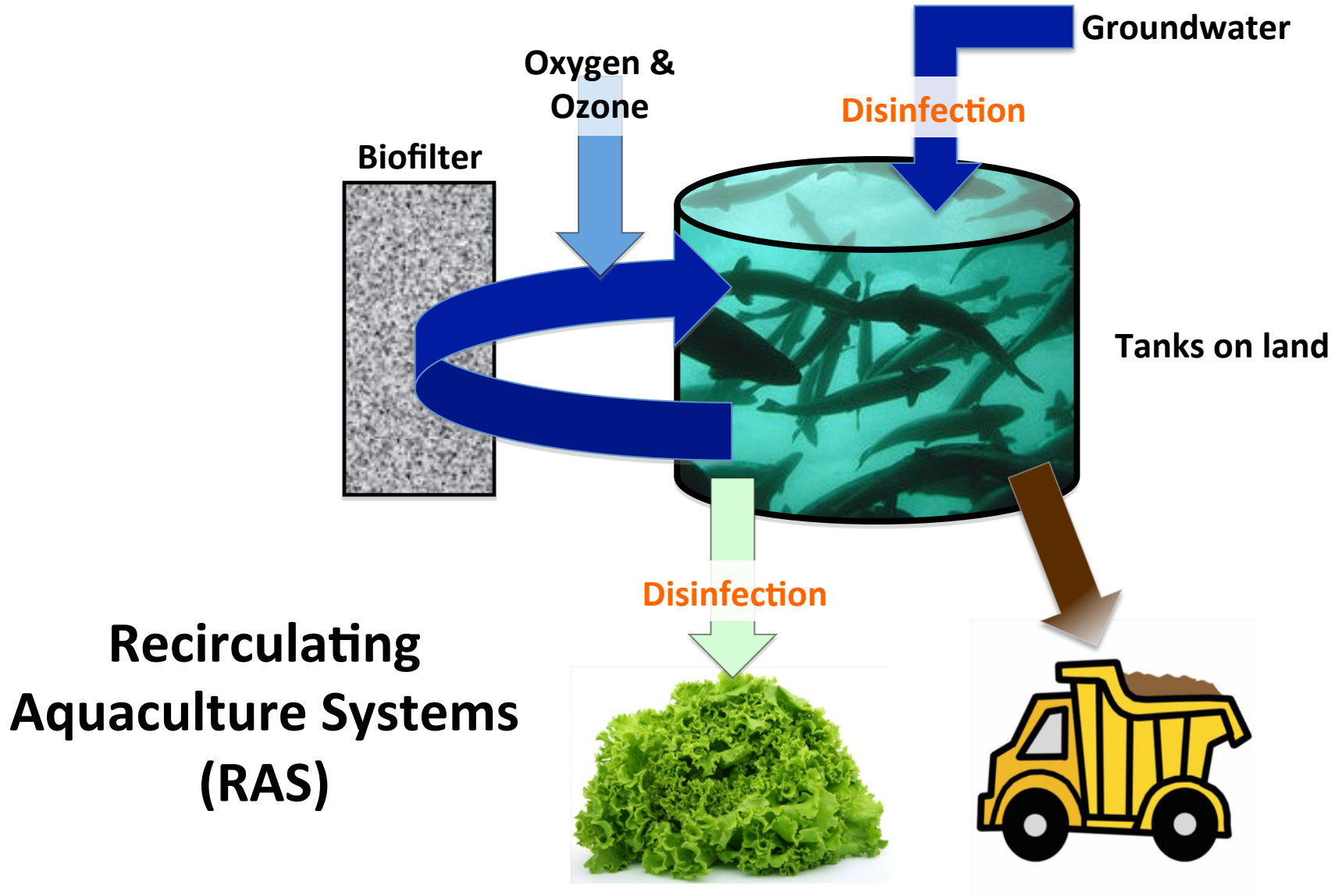


Project Overview

- First of up to 5 modules
- Groundwater disinfected on entry
- +98% of the water is recirculated on per flow basis (exchange rate 520 l/kg feed)
- All water goes through biofilters for cleaning
- Smolts disease screened & quarantined; overflow water is disinfected (chlorinated / dechlorinated)
- 3 cohorts of Atlantic salmon smolts/year
- Module 1 = 470 MT/yr at full capacity; 5 modules = 2,350 MT/yr
- Growout in 12 -15 months
- Harvest sizes 3 to 5 kg; biweekly
- 12 days depuration
- No antibiotics or pesticides
- Target density = 90 kg/m³
- Independent Environmental Monitoring via the Pacific Salmon Foundation funded by Tides Canada



A Club Med for Salmon!





Timeline

- First smolts entered the quarantine unit at 85 g
 - March 18, 2013
- Transfer to growout tanks
 - mid September 2013
- 2nd cohort into quarantine
 - October 2013
- 3rd cohort into quarantine
 - January 2014
- Harvesting of grilse (+/-2.7 kg)
 - February 2014
- Beginning of weekly harvesting of KUTERRA premium fish (3.5 - 5.5 kg)
 - April 18, 2014

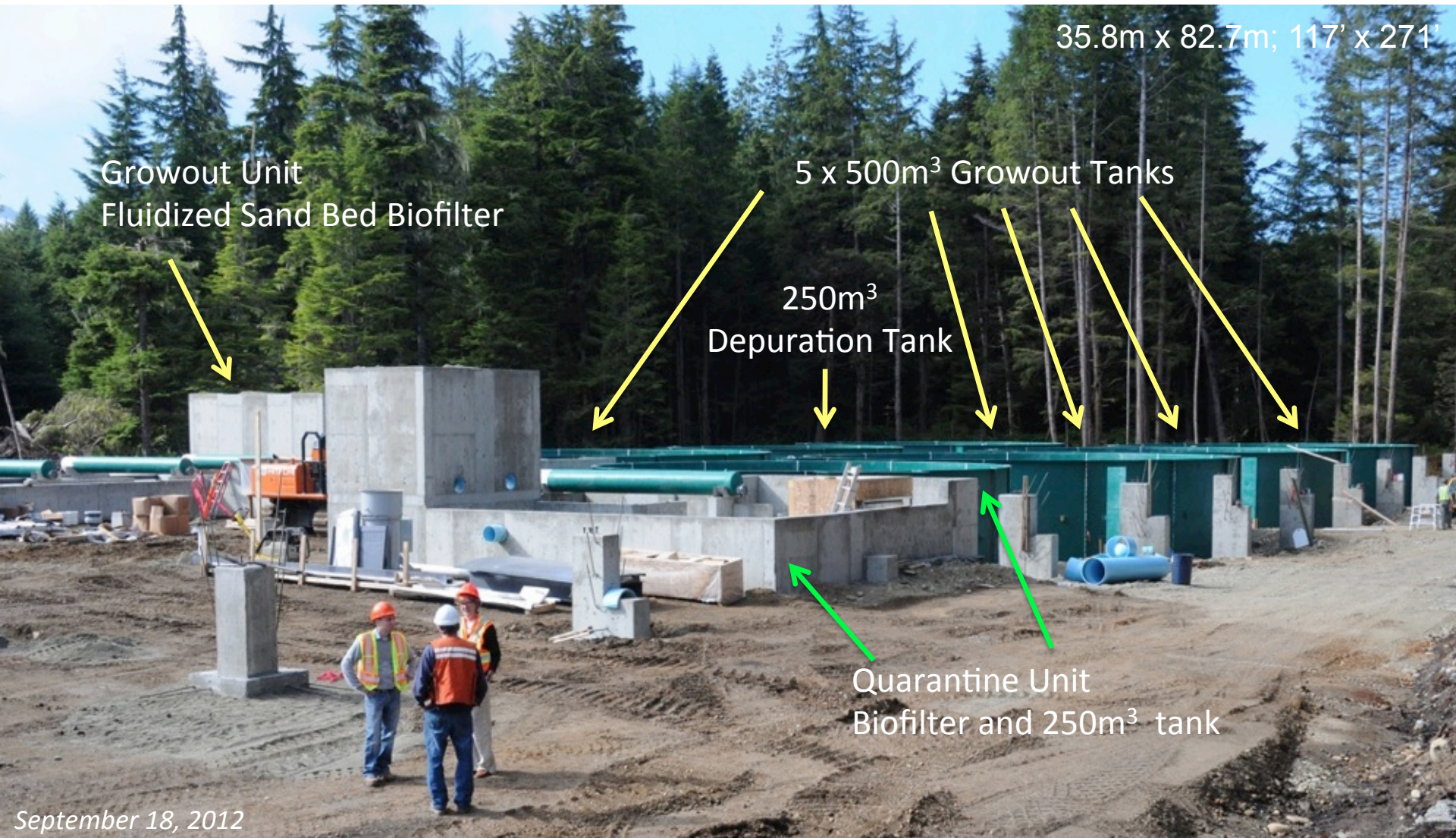


April 22nd – Chief Bill Cranmer presenting the first KUTERRA salmon offered for sale to Renée Hopfner, Director, Corporate Social Responsibility for Safeway-Sobeys.



RAS Design Overview

470 MT in 2,956m² = **159 kg/m²**





Quarantine Facility
1 tank 250 m³ & 11m diameter



Growout Facility

5 grow-out tanks @ 500 m³ & 14.6 m diameter + purge tank 250 m³ & 11m diameter



RAS Design Overview

- **Water:** Supplied from ground + UV disinfection; 16' head
- **Biofilter:** Fluidized sand biofilter (*PR Aqua*), below grade installation
- **Gas exchange:** O₂ generator (*OSI*); tank LHOs (*PR Aqua*); CO₂ stripper (*PR Aqua*); emergency O₂ back-up (*Pentair*)
- **Feeding:** Centralized pneumatic feeding system (*Feeding Systems Canada*)
- **Lighting:** Interchangeable full-spectrum LED (*Seebrite*)
- **Inventory control:** Electronic counting at grading and transfer into growout tanks (*Aquascan*), bio-scanner (*Vaki*)
- **Heating system:** Heat pump (*Geofinity*) and heat exchangers using groundwater as heat source and culture tank based heating coils





RAS Design Overview

- **Fish transfer:** Central pump (*Magic Valley*) & custom grading station
- **Fish harvest:** Purge tank and SI-7 stunner (*Seafood Innovations*)
- **Waste management:** Pneumatic mort removal system; microscreen drum filter (80 micron); concentration cones; chlorination /dechlorination system; 2 dry infiltration basins
- **Monitoring:** Centralized SCADA server (*Technical Systems Inc*) with PLC and touchscreen monitors (SCADA = supervisory control and data acquisition)





System Metrics

- **Stocking Density** (new cohort every 4 months)
 - Cohort 1 = 50 kg/m³; Cohort 2 = 75 kg/m³; Cohort 3 = 90 kg/m³
 - Bioplan incorporates overstocking and early harvest of early maturing males
 - Depuration 12 days; harvest biweekly.
- **Water Quality**
 - Temperature = 15°C
 - Salinity = 0.5 to 5 ppt (in future up to 7 ppt)
 - pH = 7.1 to 7.2
 - Nitrate = 75 mg/l NO₃-N
 - Ammonia= 1.43 mg/l
- **Performance**
 - Initial size = 85 to 100 g
 - Current size = 3 kg, 600 g, 200 g
 - Target size = 5 kg (3.5 to 6.5 kg)
 - TGC = 2.4 for 3rd cohort
 - Biological FCR = 1.2, 1, 0.7



5.9 kg after 11 months



Fixed Capital Costs of Module 1

RAS Equipment	\$ 6,000,000	\$12.76/kg
Site Development & Buildings	2,339,000	4.98/kg
Other Equipment	800,000	1.70/kg
Total Fixed Capital Costs	\$ 9,139,000	\$19.44/kg

470 MT/yr optimized production



Forecast Costs to Start of First Harvest

Inventory Buildup	\$'000
Feed & smolts	474
Labour	300
Electricity	51
Other production costs	350
Pre-production salaries, etc.	160
Administration and overhead	318
Total Operating Costs to Start of 1st Harvest	1,653
Total Fixed Capital Costs	9,139
Total Costs to Start of 1st Harvest	10,792

**Start of first harvest is March 31, 2014.*



Forecast Steady State Operating Costs

	Total (\$'000)	\$/kg HOG*	%
Operating Cost Module 1			
Feed	661	1.70	36
Labour	276	0.71	15
Smolts	345	0.88	18
Electricity	150	0.38	8
Maintenance	43	0.11	2
Fish health & water treatments	95	0.24	5
Insurance	49	0.13	3
Other operating	242	0.62	13
Total Operating Costs	1,861	4.77	100

**Swimming weight= 470 MT/YR; HOG = 390 MT/YR*



Capital Costs – Pilot vs. Commercial

	Capital Cost Per Module (\$'000)	
	First Module	Commercial Scale (4 Additional Modules)
Engineering	545	390
RAS Equipment	2,900	2,200
RAS Installation	2,555	1,500
Civil Works	1,359	610
Main Building	980	880
Other Equip.	800	220
Cost Per Module	9,139	6,000
Permanent Inventory	1,896	7,200
Hatchery		1,500
Total Capital Cost	11,035	32,700





Financial Projections

	EBITDA Module 1
2014	\$780K
2015	\$1.0M
2016	\$1.0M

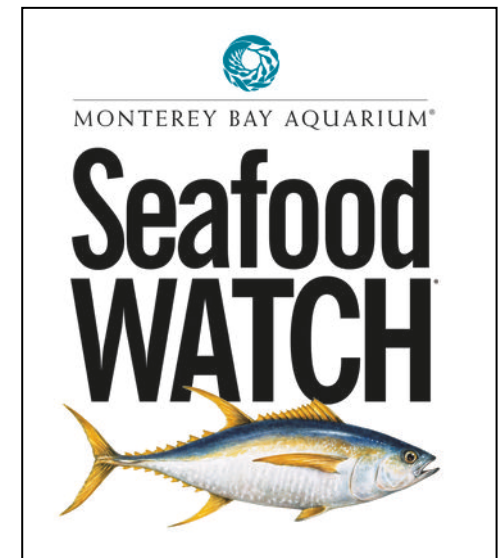
EBITDA Module 2
Adds \$1.4M/year by 2018



Branding and Marketing

A brand that is distinct from wild salmon branding, differentiates from open net-pen raised product, and captures a premium.

- Key attributes include:
 - Premium product (taste, quality, therapeutant free)
 - First in Canada; produced by People of the Salmon
 - Sustainability – meeting Monterey Bay Aquarium’s green ranking criteria
 - Optimal rearing conditions / good animal husbandry
 - Prevent interaction with marine environment
 - Protect wild salmon stocks
 - Traceable product
 - Control all waste
 - Preserve water
 - Support regional economy



Branding and Marketing

- Key marketing focus – **LAND RAISED**
- **Kutula** – salmon
- **Terra** – earth, land
- **KUTERRA** – salmon from the land





Branding and Marketing

- By differentiating, KUTERRA premium land raised salmon is not linked to the commodity pricing of the ONP product.
- KUTERRA has a strategic alliance with Albion Fisheries for processing and distribution - structured so both parties are incentivized to garner premium pricing.





Safeway to sell Canada's first land-raised salmon

Company behind North America's first land-based commercial Atlantic salmon farm breaks into retail scene.

Thursday 24 April 2014



undercurrentnews
seafood business news from beneath the surface

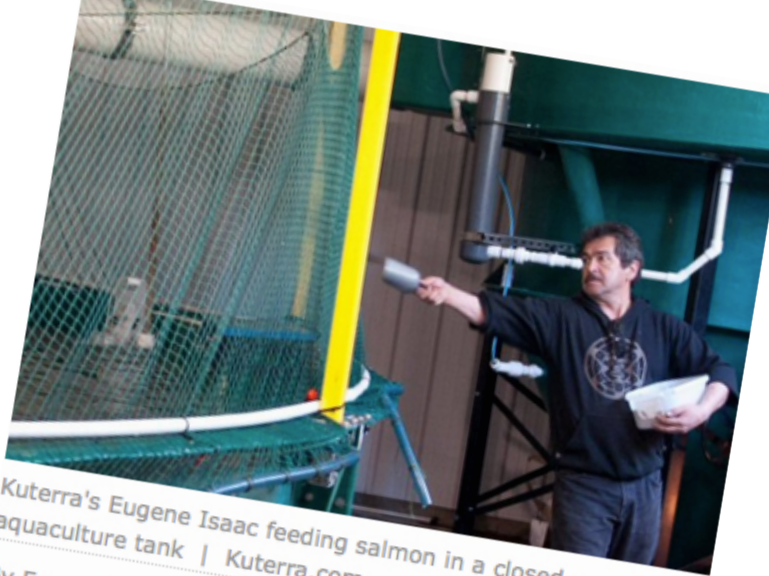
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Onshore-raised salmon makes its way to Safeway in Canada

Tank-raised Atlantic salmon heads to off-Island stores

CARLA WILSON / TIMES COLONIST
APRIL 22, 2014 09:22 PM

Print



Kuterra's Eugene Isaac feeding salmon in a closed-aquaculture tank | Kuterra.com

By Emma Crawford Hampel
Tue Apr 22, 2014 2:36pm PST

BUSINESS VANCOUVER
Kuterra brings first land-raised Atlantic salmon to market



Gerry Alfred, left, and Mike Jolliffe work at the first harvest of Kuterra land-raised Atlantic salmon at the Port McNeill facility run by the Ōnāmgi First Nation. Photograph By KUTERA.COM



Challenges and Opportunities

- Timing issues
- Smolt supply
- Mortality of the commissioning cohort
- Pumps
- Salinity
- Grilsing
- Lowering capital and production costs
- Maintaining premium pricing





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