



Program Update

December 10, 2012

ERWS Management Board Meeting

Prepared By: Mike Squire, ASCT
AWS / ERWS Program Manager

History:

Phase OneStorage (complete)

Phase Two.....New Intake

Phase Three.....Treatment

Ex. / Interim Intake

City of Parksville

Morrison Creek

Nanoose Bay (RDN)

Original Proposed Intake Location

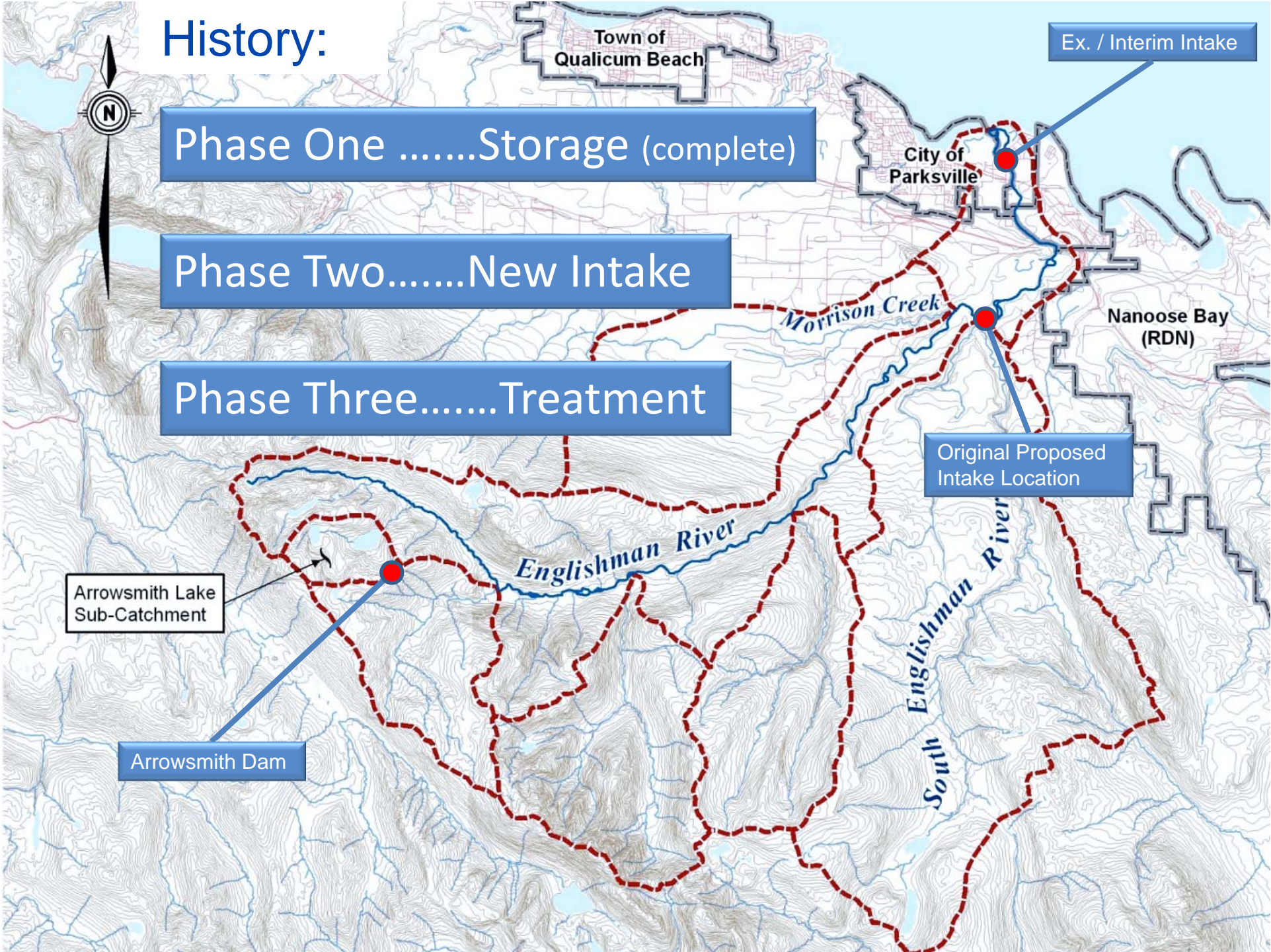
Englishman River

South Englishman River

Arrowsmith Lake Sub-Catchment

Arrowsmith Dam

Town of Qualicum Beach

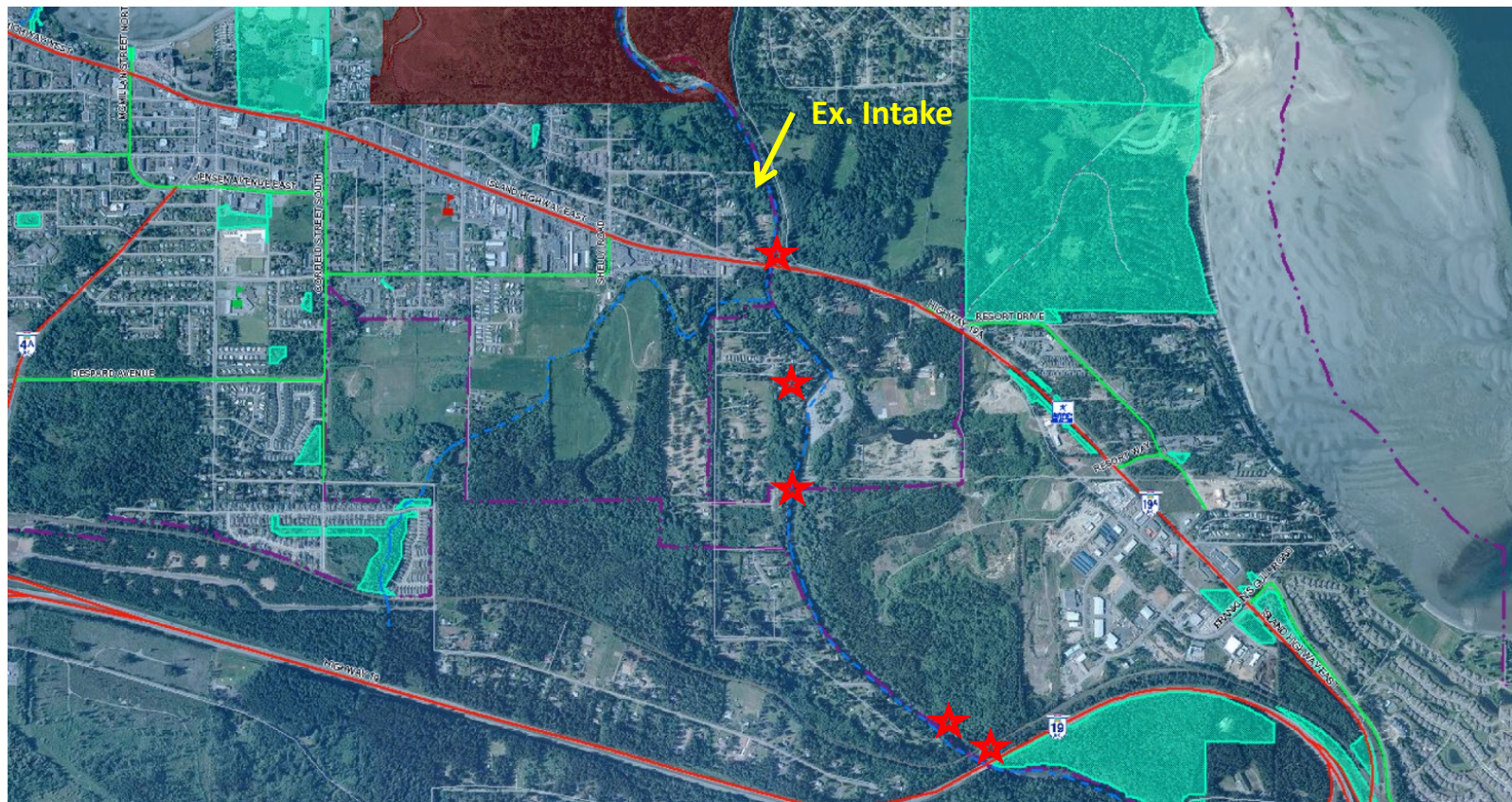


Vancouver Island Health Authority (VIHA) Concerns

Existing / Interim Intake Location

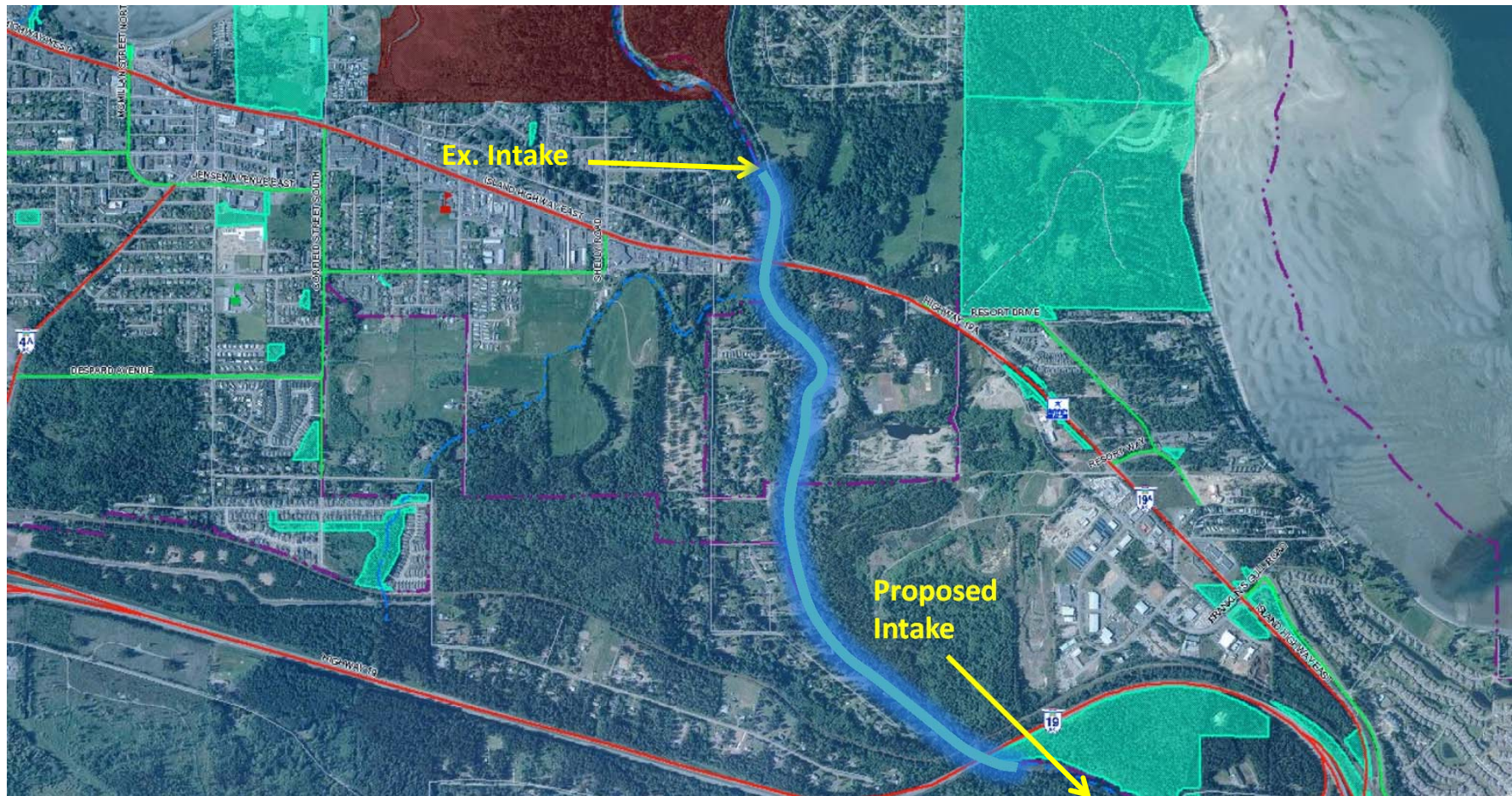
Location (**risk** of contamination):

- ★ Below two Highways.....fuel spill
- ★ Below Railway / Septic Fields / Oil Tanks
- ★ Below Flood Plain / In Flood Plain
- ★ Below Sanitary Sewer Crossing



Department of Fisheries and Oceans (DFO)

.....As far downstream as possible to allow
more water for fish



Condition 6.

To be constructed by December 31, 2016

In accordance with VIHA 4321 treatment policy for the Englishman River water source, provide finished water quality using technology that will achieve the following performance standard; a 4-log removal/inactivation of viruses, a 3-log removal/inactivation of Giardia cysts and Cryptosporidium oocysts, provide two treatment processes and produce finished water with less than 1 NTU turbidity.

In consultation with, and in reference to the City of Parksville letter dated February 4, 2009 (Your file 5600-10-AWS), the City of Parksville is required to meet the following implementation plan:

May, 2009: Obtain the services of a professional engineering firm to develop a conceptual plan and preliminary design for a water intake and treatment facility.

November, 2010: Conceptual plan and preliminary design is completed.

December, 2013: Detailed design of the new intake and treatment facility is completed.

January, 2015: Construction for the water intake and treatment facility commences with completion scheduled for **December 31, 2016**.

Date: April 24, 2009

B. W. Weirall

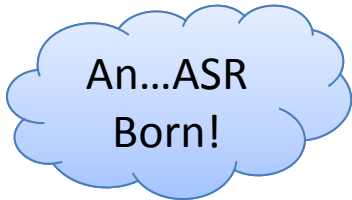
Next Stage of Planning Investigation:

Quality Based Engineering Selection

Terms of Reference - Expressions of Interest
Shortlist to three

Submittals:

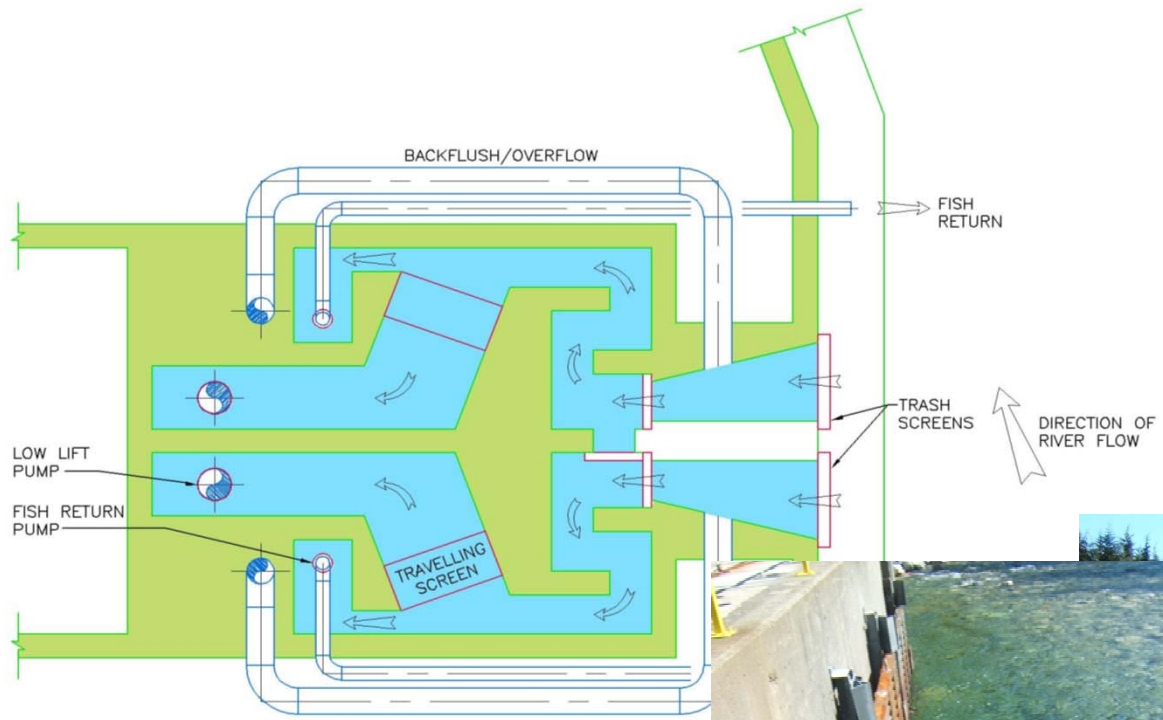
- Proposal
- Presentation
- Question and Answer Period



Combine Resources and defined Scope of Work
Negotiated Fees based on Scope of Work
Contract for Next Phase of Engineering Services

Informal Value Analysis

What we know.....



Riverbank Side Inlet



Treatment type.....

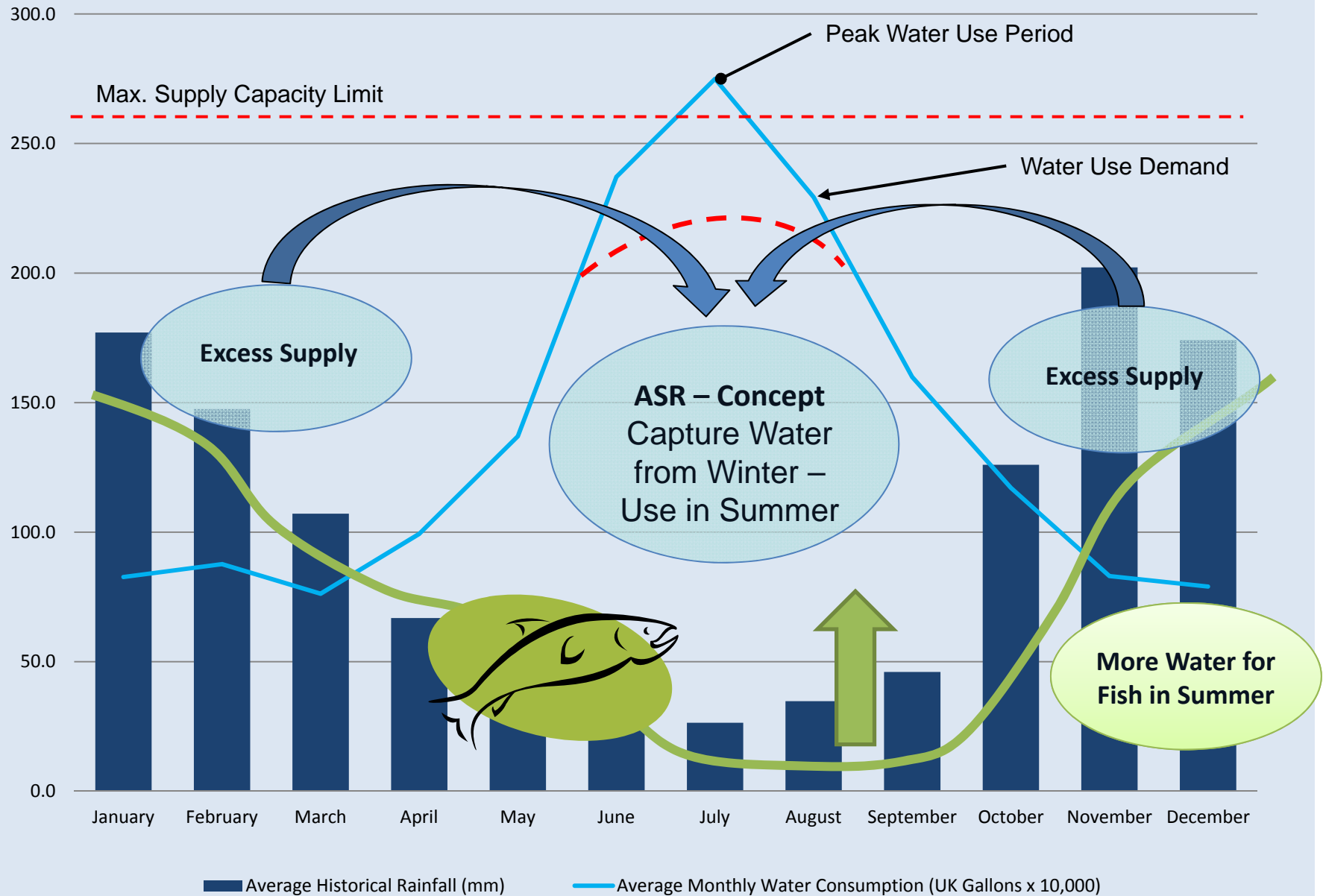
**Preliminary Reports Recommend
Membrane Treatment best suits the
Englishman River water source**

Reviewed: Capital and Operating

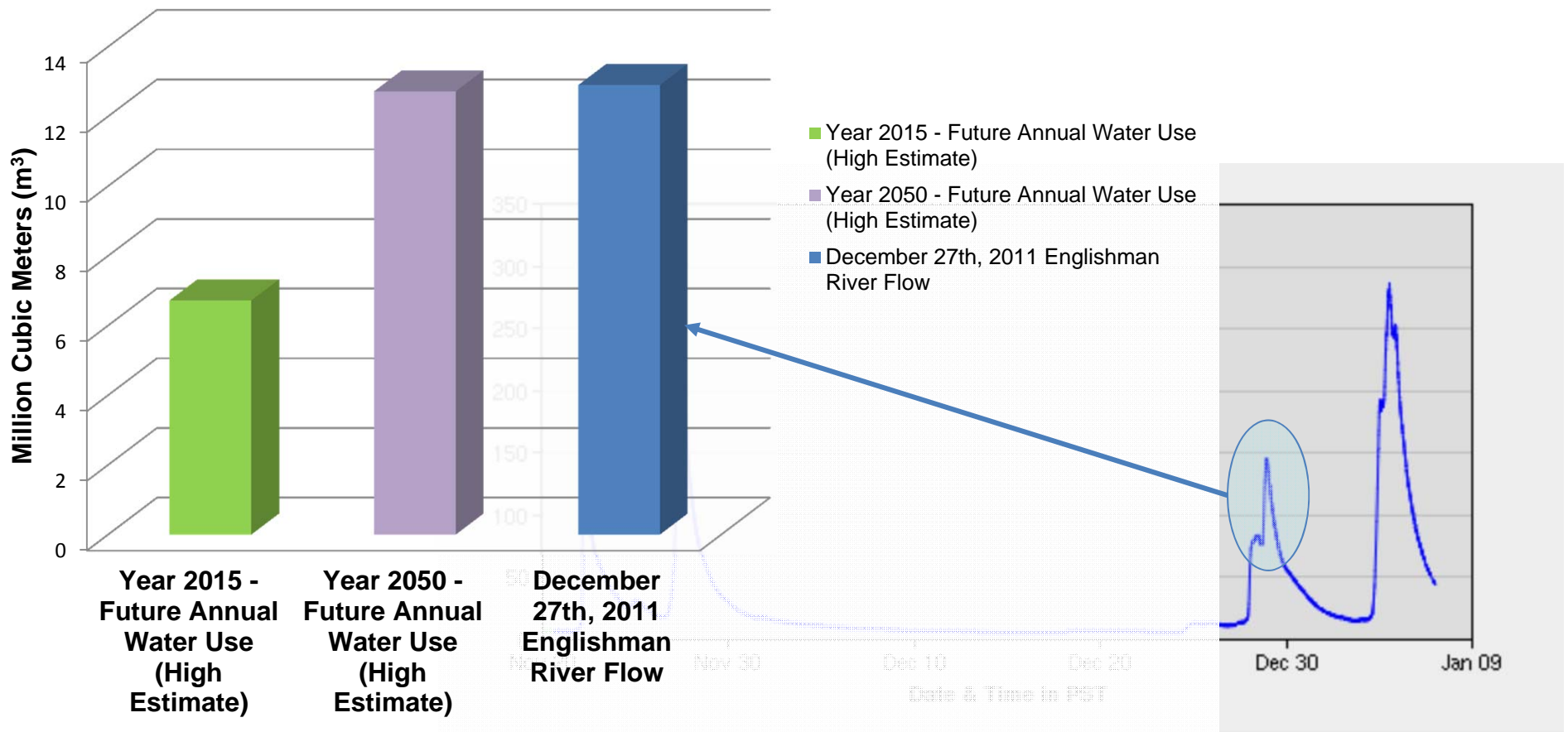


ASR.....

Illustration of Average Monthly Rainfall vs. Monthly Water Consumption



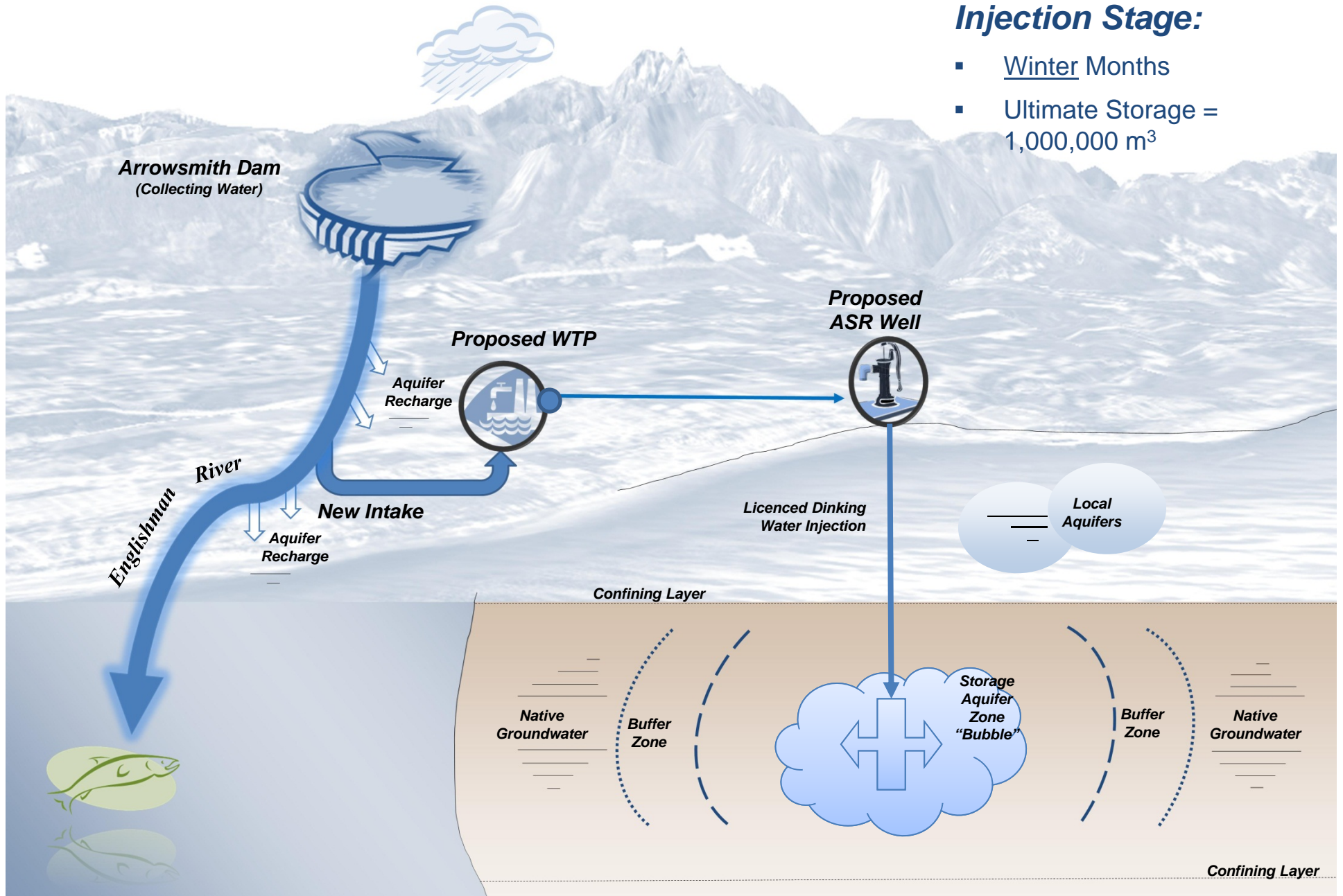
Water Management = Water Harvesting



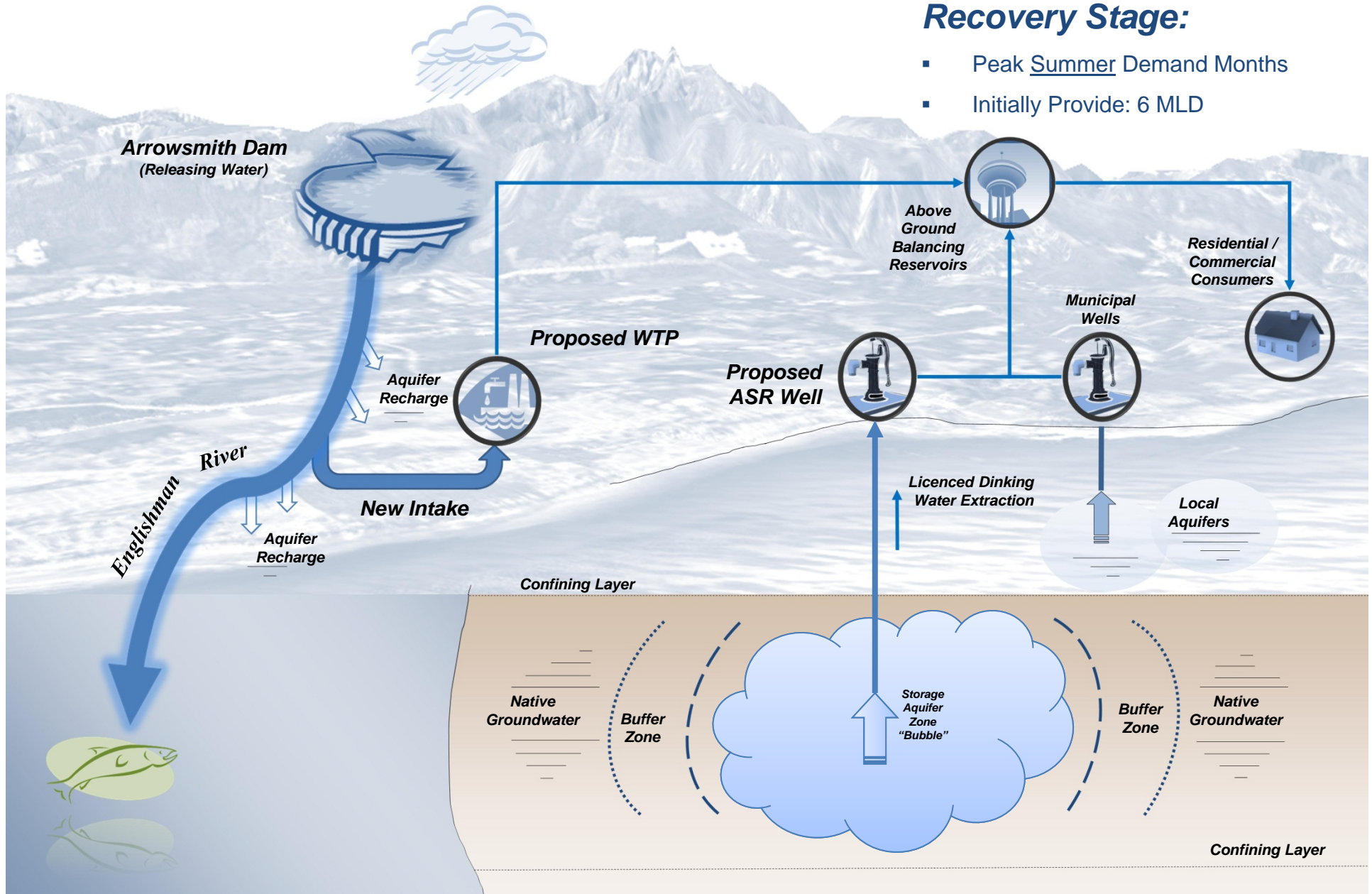
Need To Look at:

Innovative, Cost Effective ways to harvest Fresh Water for use year-round and in Peak Demands

Aquifer Storage Recovery (ASR).....our plans



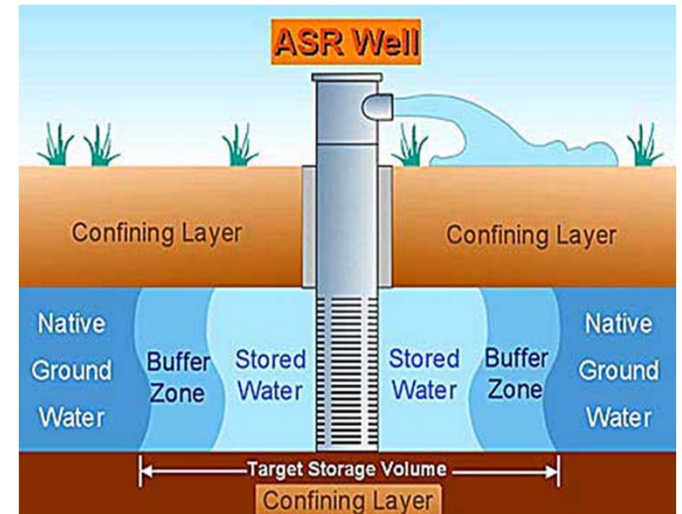
Aquifer Storage Recovery (ASR)....our plans



Why ASR.....

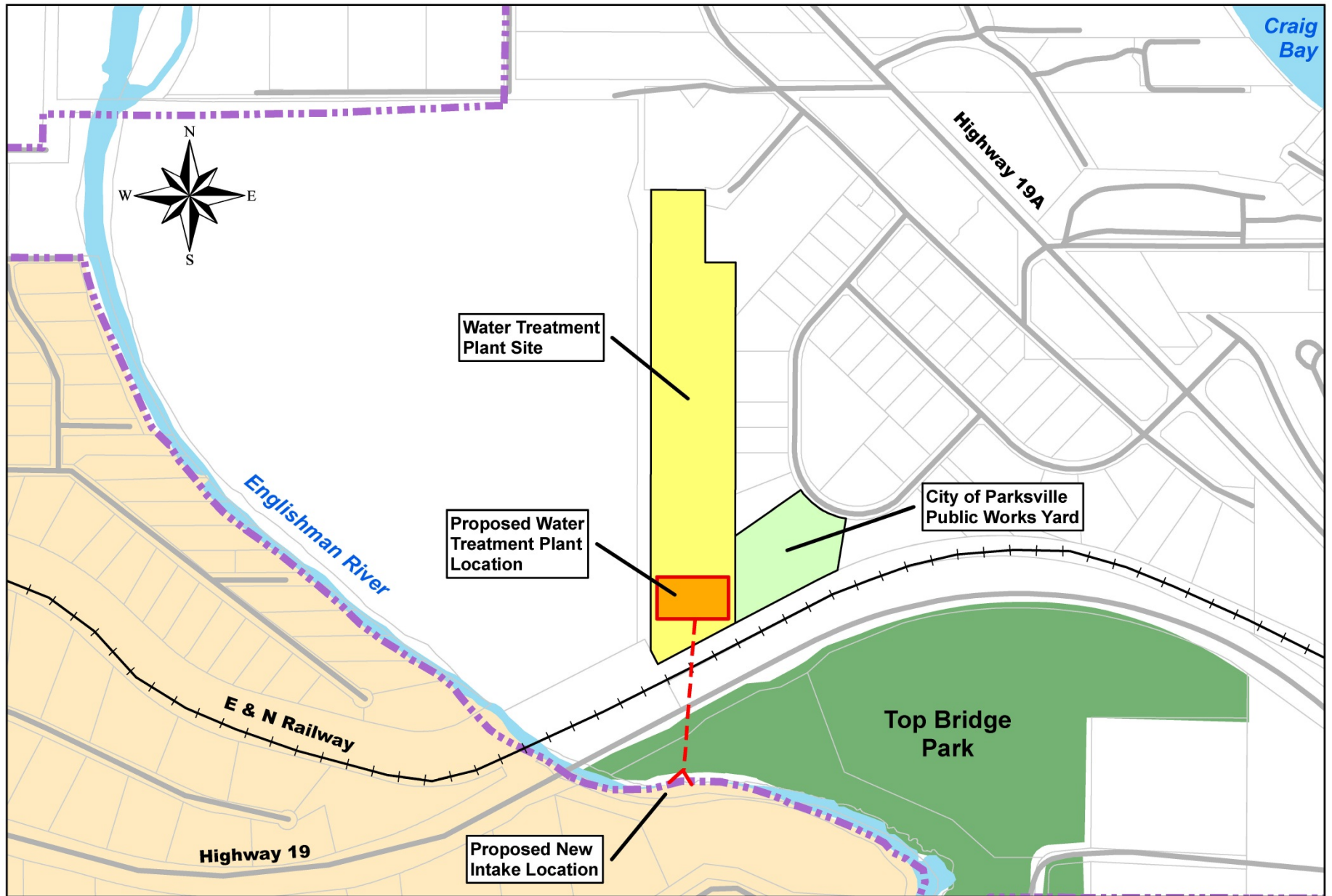
Aquifer Storage Recovery (ASR)

- Third Source of Water Supply
- Reduce Water Treatment Plant size
- Allows a balanced water supply
- Provides cooler water to consumers in the summer
- More feasible than conventional above ground potable water storage
- Allows treated water from the winter months to be stored for use in the summer
- Less Surface Water Use during Peak Summer Demands - up to 50 % (Environmental – more water available for fish)
- Defer or Reduce Infrastructure Expansion

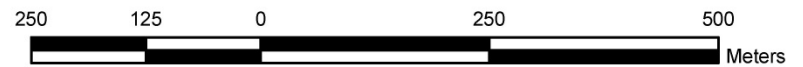


ASR Challenges:

- Uncertainties, require thorough engineering review and well drilling, piloting and investigation (up front engineering costs)
- Currently no groundwater regulation – Water Act.
- Health Authority regulations / approvals – first in BC



Proposed Water Treatment Plant





Future Water Treatment Facility

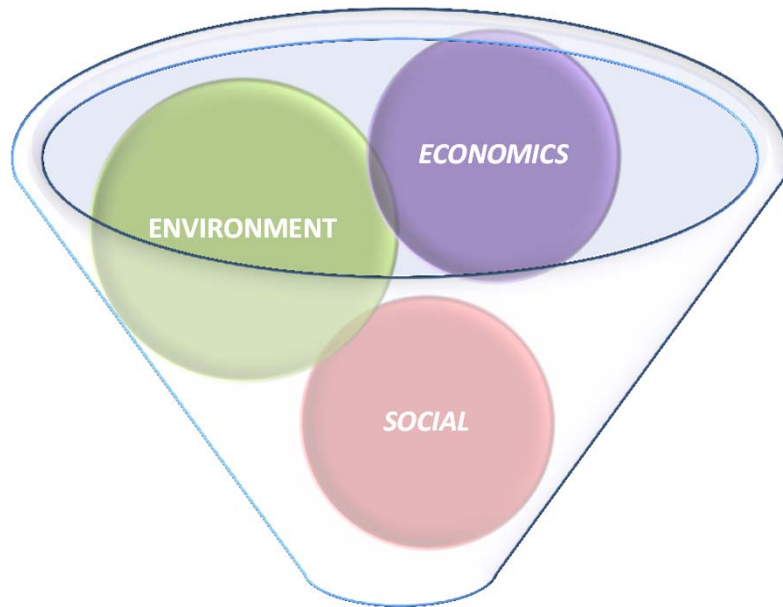
Proposed Intake

Emergency Connection to River's Edge

Future ASR Wells

Going forward.....

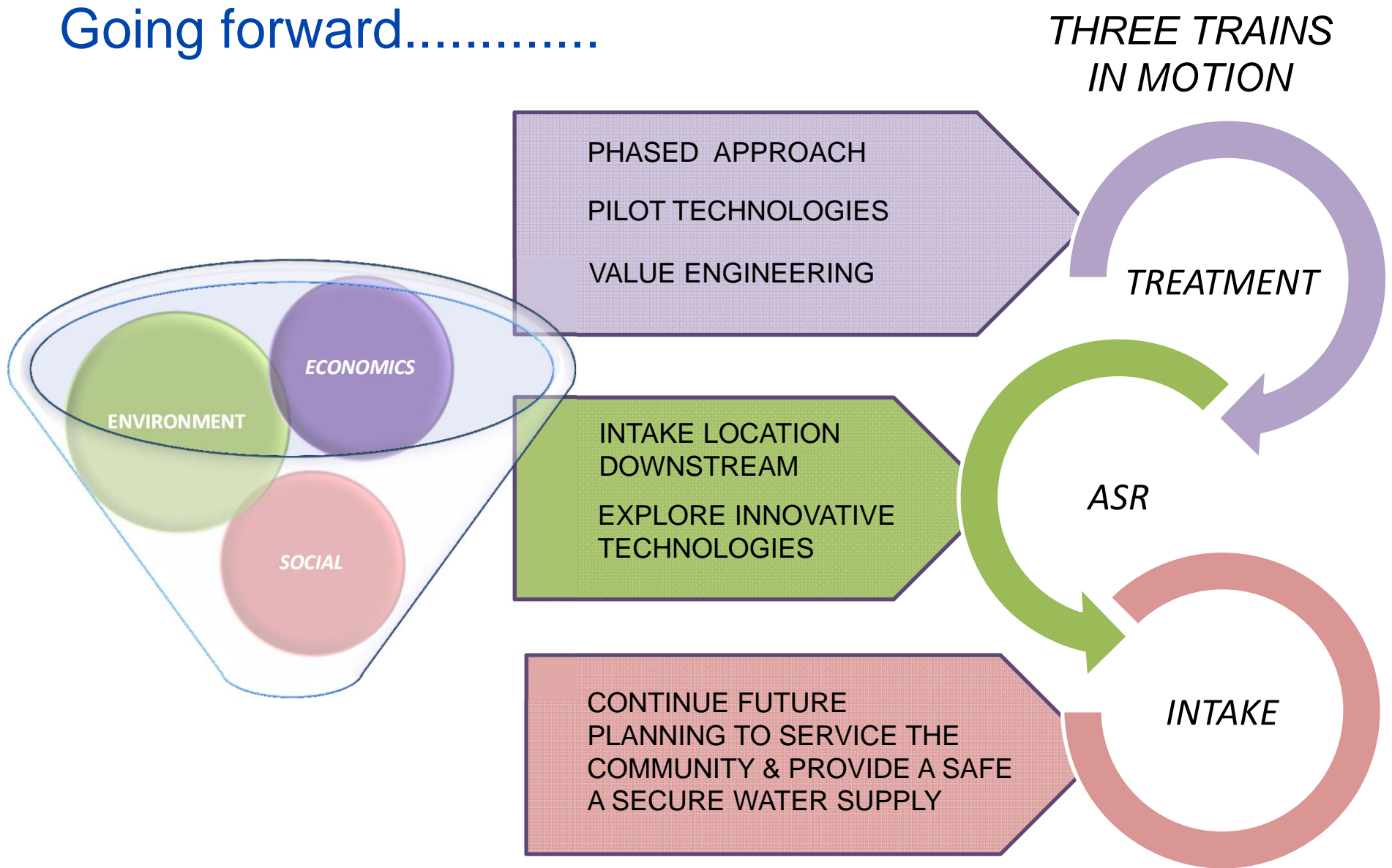
SUSTAINABLE



SOLUTIONS (OPTIONS)

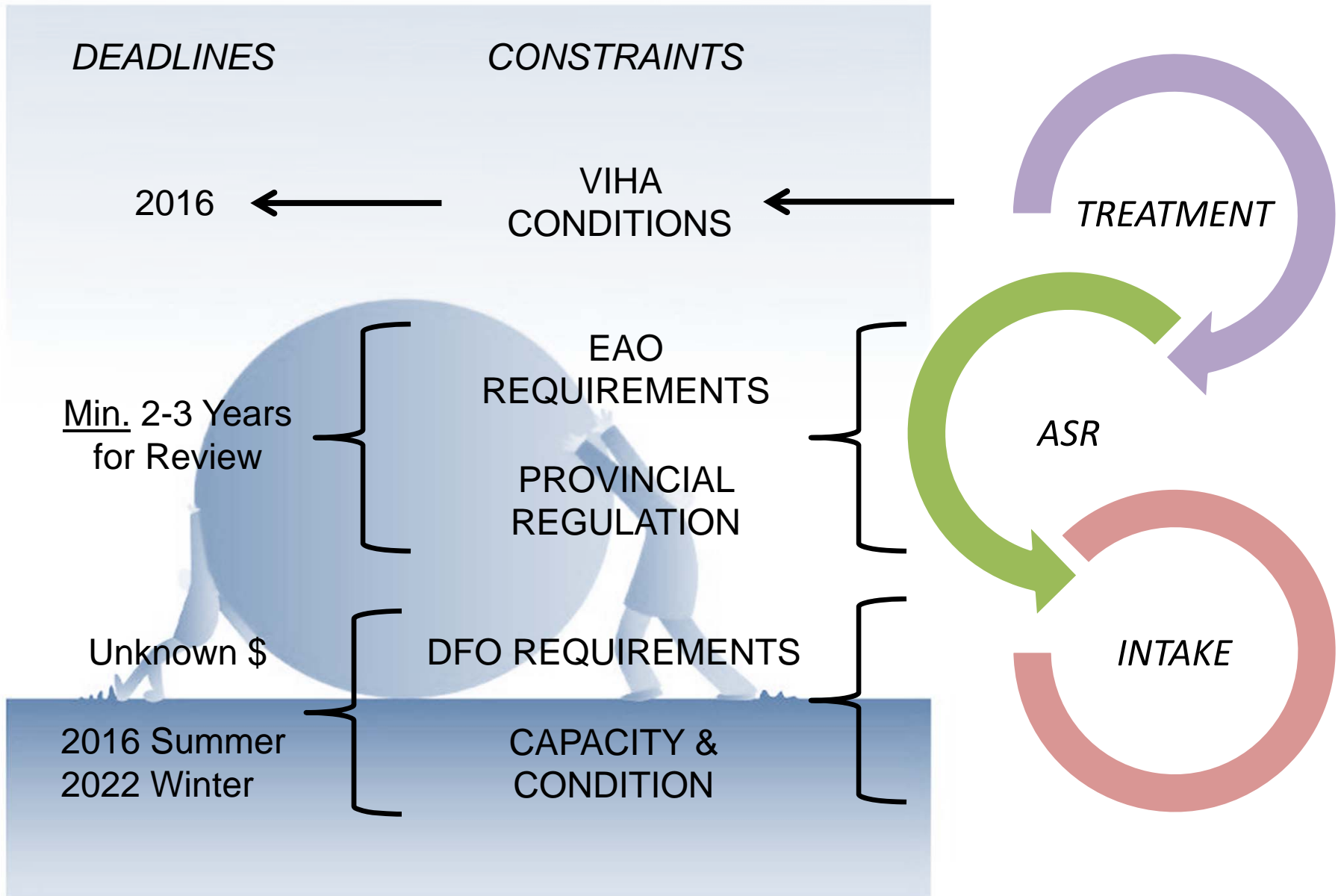


Going forward.....



Going forward.....

THREE TRAINS
IN MOTION



Going forward.....

DFO

- It is their understanding that recommendations they provided to BC Water Management was based on the intake being permanently located downstream of the WSC hydrometric gauge (Orange Bridge).
- Would like us to complete the Instream Flow Study by Ecofish Research. ~ \$100,000.
- Reply letter was sent on September 28, 2012
 - correct their understanding
 - recognize benefits of the Arrowsmith Dam
 - follow original intention for flow augmentation
 - would participate in study given the above
 - need to look a pre dam, current and future flow conditions

MFLNO – Fisheries Section

- Discussed potential opportunities to partner in the remediation of the E.R. clay banks. Project costs > 1 million. Potential grant opportunity. Discussed Operation Rule Curve

VIHA

- Happy with our progress to date and commend us for looking at innovative sustainable technologies (ASR) for future water supply.

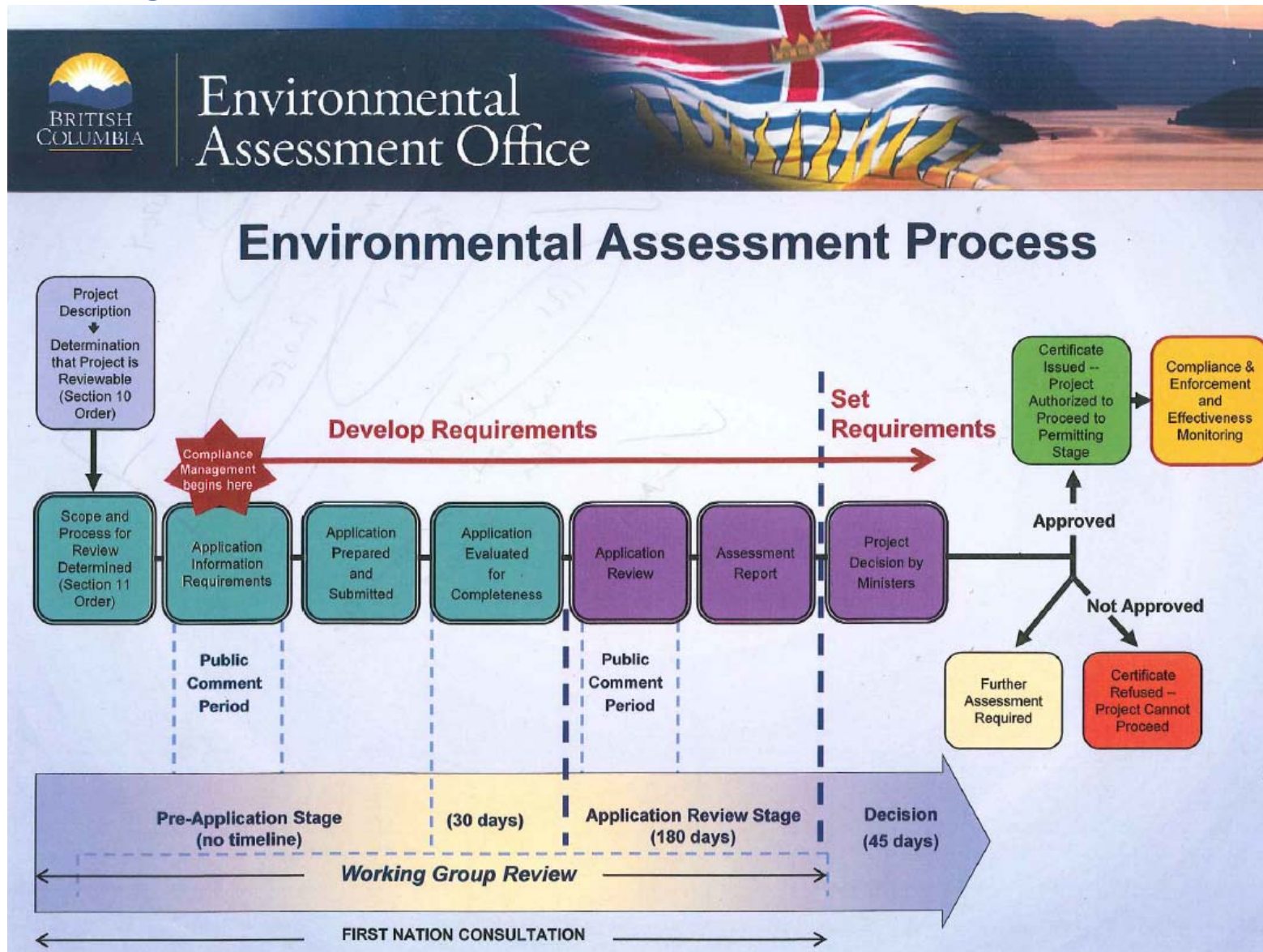
MFLNO – Water Protection

- Supports ASR and does not consider injection of licensed potable water into the aquifer as 'groundwater'.

Environmental Assessment Office (EAO)

- Considers this project reviewable given the extraction rate of > 75 liters per second of groundwater.
- Explained the ASR process is a no net loss to native groundwater. This review process would significantly impact our project schedule and meeting our VIHA deadline.

Going forward.....



CONSTRAINTS PUT IMPLEMENTATION PLAN IN JEOPARDY

Going forward.....

DEADLINES..... **CONSTRAINTS PUT IMPLEMENTATION PLAN IN JEOPARDY**

OPTIONS:

1. Explore Phasing Options (i.e. Filtration Deferral)
2. Reduce ASR Scope of Work.....
3. Start Pre-Design on Intake.....
4. Reduce Water Consumption



COST vs. RISK
(ensure feasibility)






COST & RISK
Balance

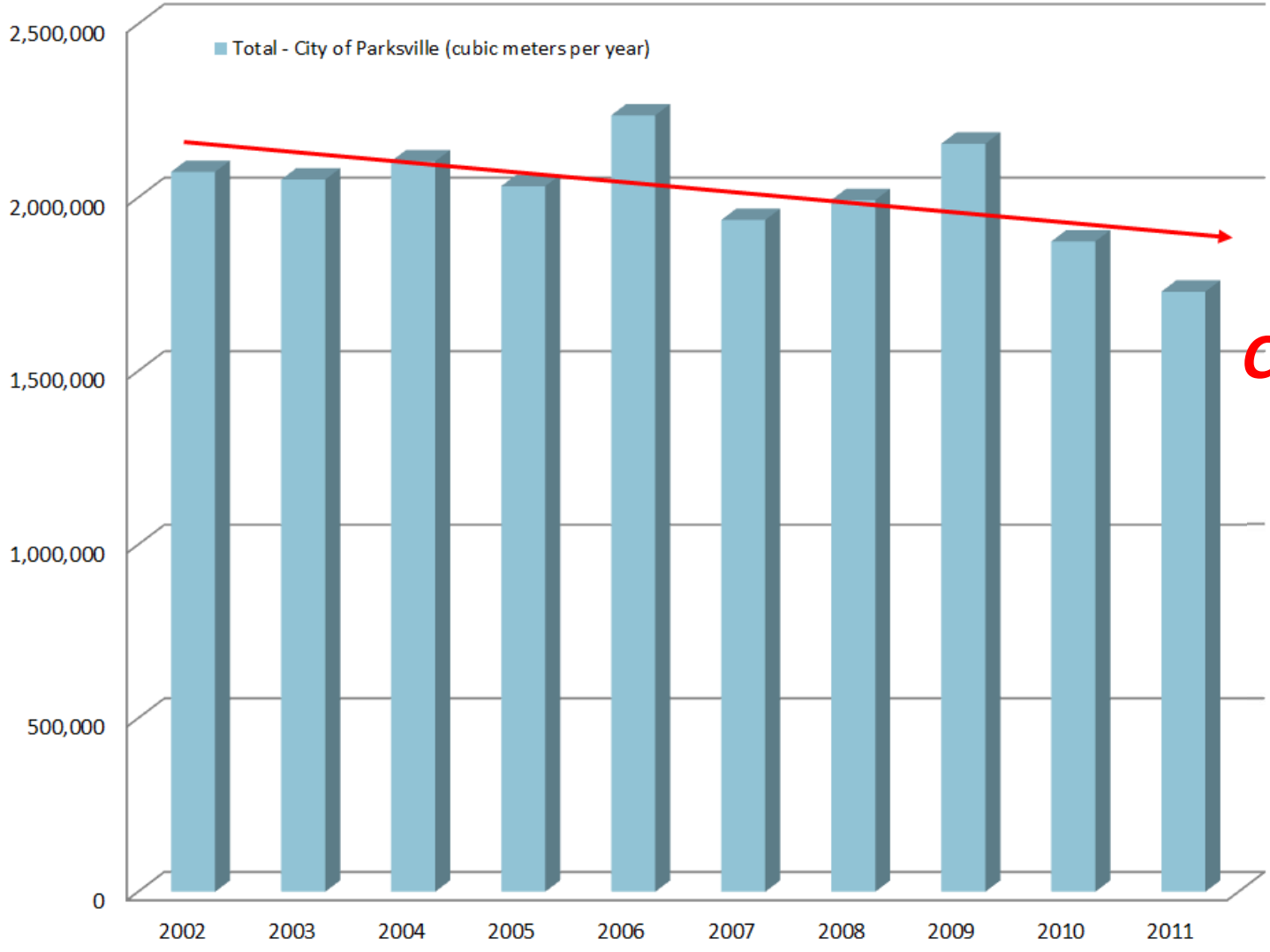
Going forward.....

DEADLINES..... **CONSTRAINTS PUT IMPLEMENTATION PLAN IN JEOPARDY**

4. Reduce Water Consumption.....

	Total Residential Daily Use (liters per capita per day)	
National Average	274	
British Columbia Average	353	
Parksville Average (2002 - 2006)	375	
Parksville Average (last 5 years)	<u>319</u>	

Good News.....

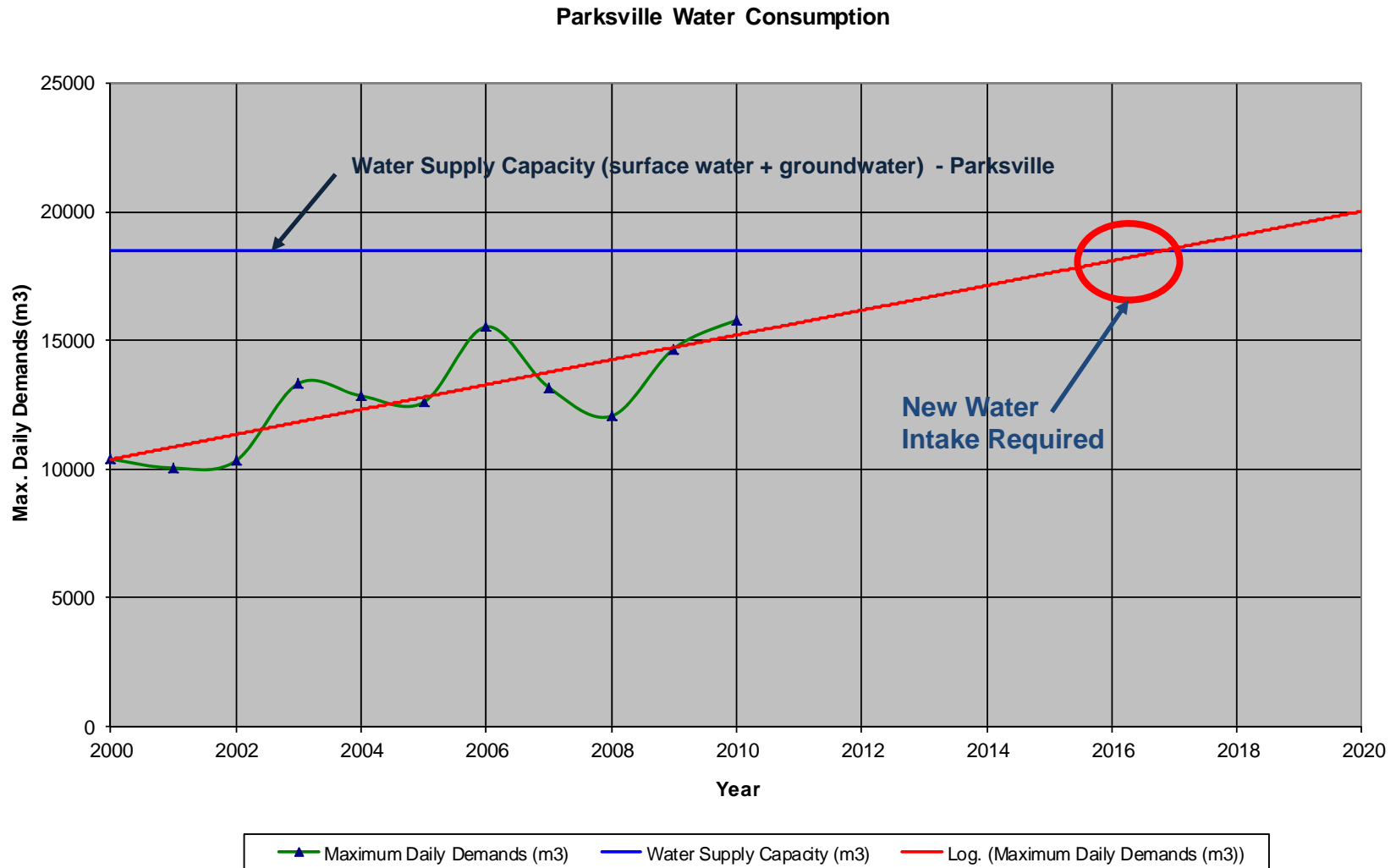


Water Conservation Works !!!



Total Annual Water Use – Declining Trend

Why do we need a Surface Water New Intake ?

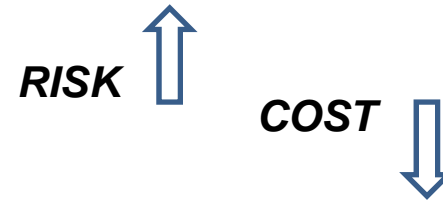


Going forward.....

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1. Explore Phasing Options (i.e. Filtration Deferral)



2. Reduce ASR Scope of Work.....

COST vs. RISK

3. Start Pre-Design on Intake.....



4. Reduce Water Consumption

**COST & RISK
Balance**

5. Stop Growth

FINANCIAL ?Inflation

SOCIAL ?Does This Meet OCP Objectives ?

Is This Sustainable ?

Still Require Treatment + More Built in Redundancy



Why do we need Water Treatment and Redundancy ?

- Clay Banks – July 2012
 - Erosion of the clay banks causes significant turbidity in the Englishman River
 - Recent erosion in the critical summer months has caused the water surface supply to cease.....well supply can't keep up.

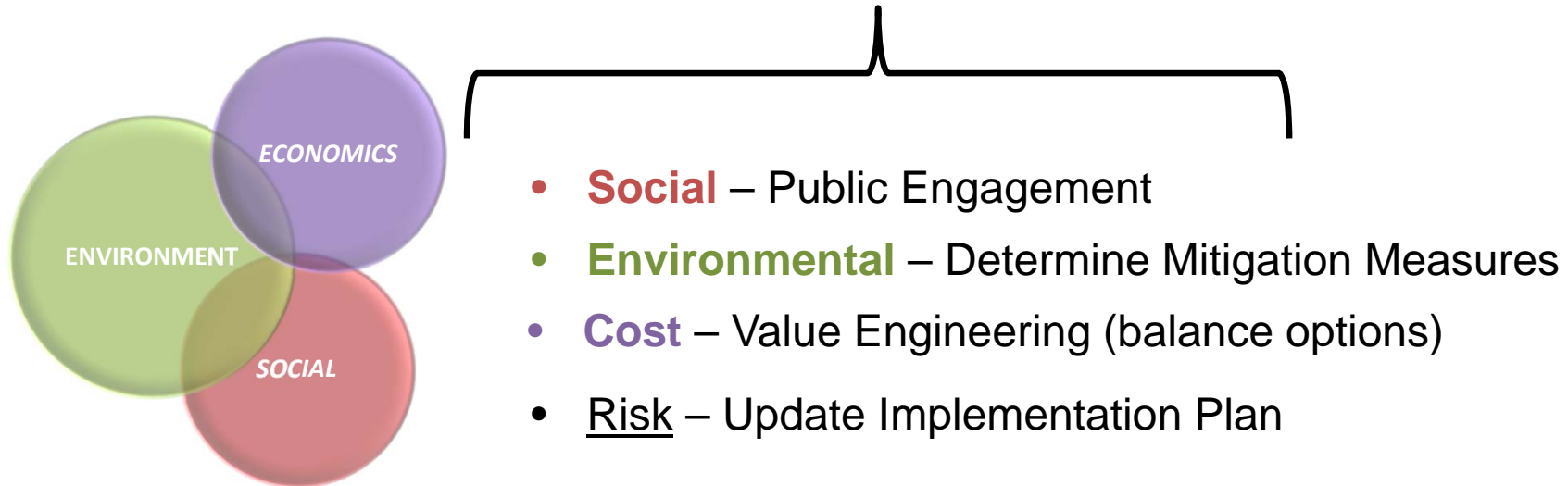


Going forward.....

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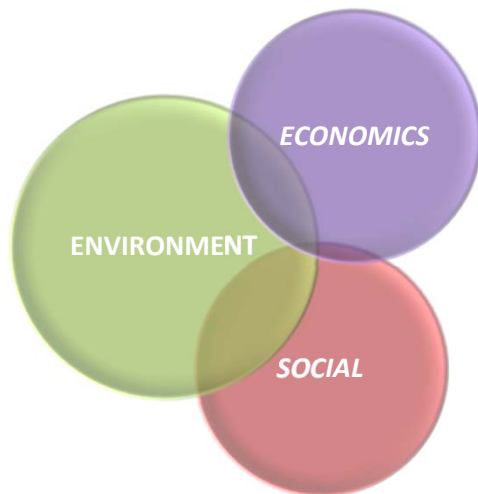
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2. Reduce ASR Scope of Work.....
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4. Reduce Water Consumption
5. Stop Growth



Summary.....

Update - PROGRAM SCHEDULE

1. Water Treatment Pilot - Complete
2. One Year Water Quality Monitoring - Complete
3. ASR Phase 2 – Full ASR Well Injection / Extraction Testing deferred to May 2013

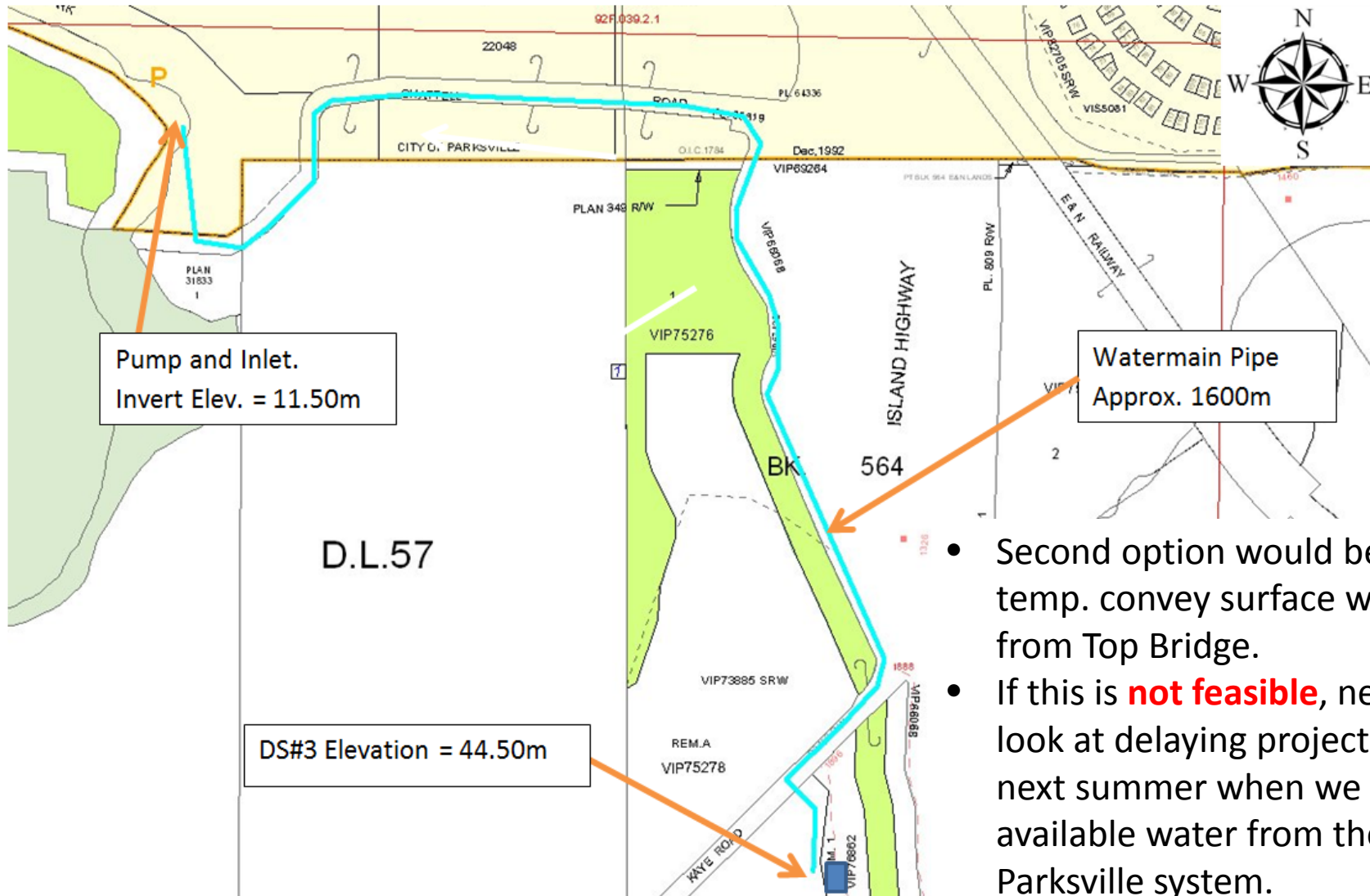


ASR - Investigation

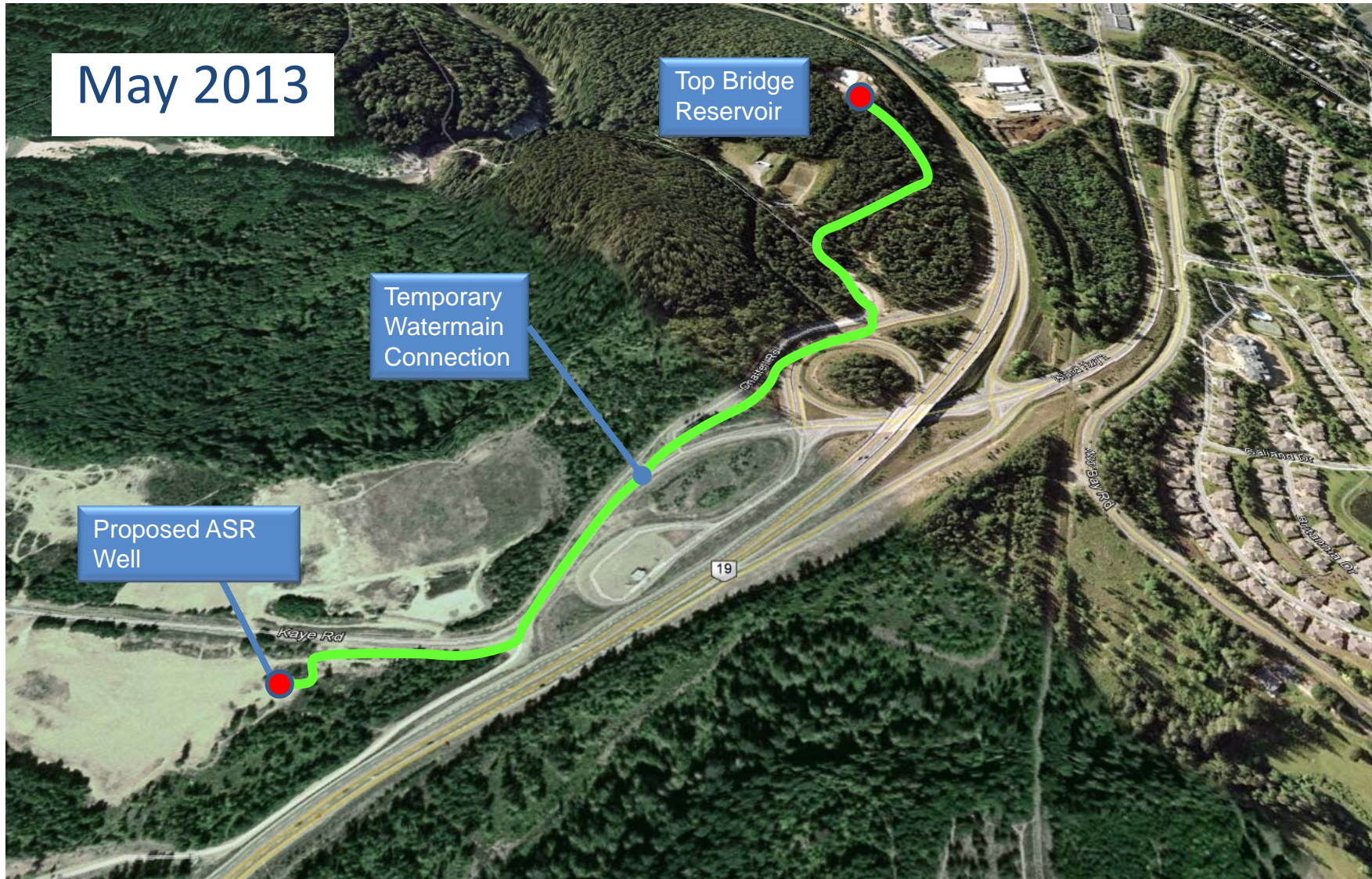


ASR - Investigation

Top Bridge Park – Temp. Water Intake Option



ASR - Investigation

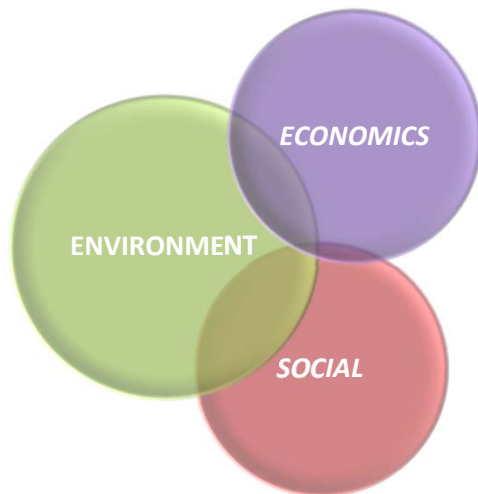


Summary.....

Update - PROGRAM SCHEDULE

1. Water Treatment Pilot - Complete
2. One Year Water Quality Monitoring - Complete
3. ASR Phase 2 – Full ASR Well Injection / Extraction Testing deferred to May 2013
4. Conceptual Design Update – Fall 2013
5. Change of Works Application.....?
6. Conditional Operation Rule

} **Next Steps:**



- Start Preliminary Design - Intake (Engage Consultant)
- Review filtration deferral – Financial Model
- Update Implementation Plan
- 2013 Provisional Budget (Five – Ten Year Plan)
- Continue stakeholder meetings

Stakeholder Meetings

1. July 23, 2012 – Presentation to Martindale Residents Association
2. September 13, 2012 – Meeting with Ministry of Community, Sport & Cultural Development – Borrowing Authority Issues
3. September 20, 2012 – Presentation to Knox United Church group
4. October 18, 2012 – Meeting with EOA, VIHA, & MFLNO regarding ASR program





*An environmentally
sensitive use of water to
improve fish habitat and
domestic water supply.*

THANK YOU.....questions ?

www.arrowsmithwaterservice.ca