LIQUID WASTE MANAGEMENT PLAN (LWMP)
for the
COMOX VALLEY SEWERAGE SYSTEM (CVSS)

Joint Technical Advisory Committee and Public Advisory Committee (TACPAC)

Meeting #5

February 8, 2019

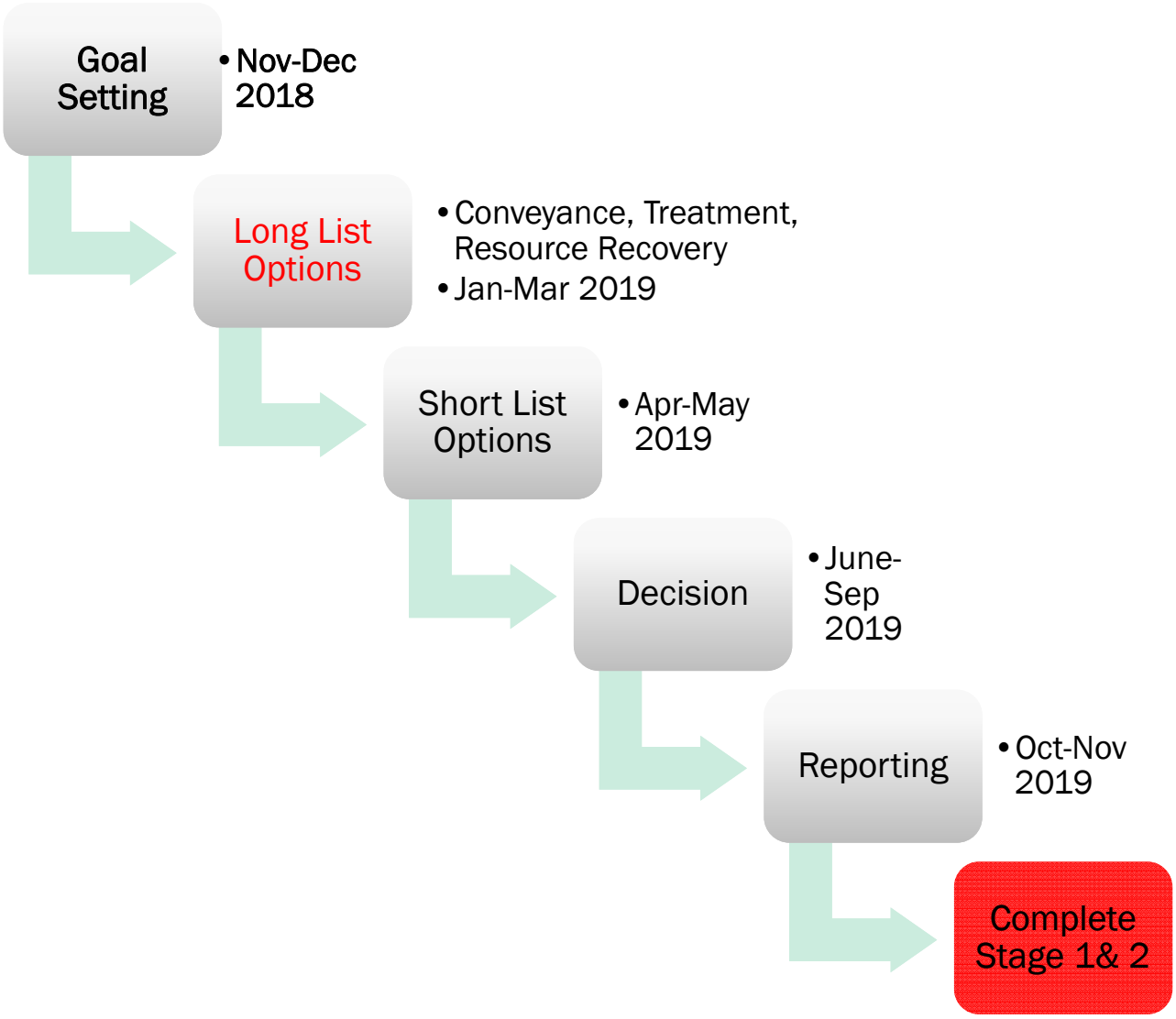
- Finalizing the Long List Options

Comox Valley REGIONAL DISTRICT

Today's Agenda

- Quick review of LWMP process
- Developing ideas for use of reclaimed water
- Review of public feedback on Long List Options
- Finalize Long List Options and recommend to CVSC for Conceptual Study
  - Conveyance
  - Treatment
  - Resource Recovery
- Technical Update
  - Understanding Cost Estimates
  - Conveyance Hydraulics

LWMP Road Map – CVSS Stage 1 & 2



What happens with the Long List?

1. WSP develops a conceptual study of the long list options (one month)
2. The TACPAC reviews them at Meeting #6, March 21
3. Run long list options through the evaluation system and develop short list
4. Confirm results reflect committee's input
5. Short list options for detailed study

What happens with the Short List?

1. Recommend the short List to the Comox Valley Sewage Commission (April 16).
2. TACPAC review of detailed studies at Meeting #7
3. The short list options are released for **final** stage of public consultation and input (April/May)
4. Feedback from Public Consultation and final evaluation of short list options at Meeting #8
5. Recommend to CVSC, decision in September

LWMP Stage 1&2 Report

Purpose is to document the process

- The goal setting
- Long list studies and decisions
- Short list studies and decision on preferred option
- Simplified financing analysis

Target date for completion is end of 2019

LWMP Report

Includes other technical studies, information, recommendations

- Population, flow and loads
- Regulatory aspects
- Environmental aspects (outfall)
- Infiltration & inflow
- Water conservation
- Biosolids management

Important Dates

Date	Activity
March 21	TACPAC 6 – Evaluate Long List, recommend Short List to CVSC
April/May (TBC)	Online consultation for short list options
Week of May 20th/27th (TBC)	TACPAC 7 Review Short List options, public & online feedback, preliminary evaluation
May 29&30	Public Workshop #4 – review and rank Short List options
June 13th (TBC)	TACPAC 8 – finalize evaluation to recommend Preferred Option(s), recommend to CVSC
Sep	CVSC to decide on Preferred Options and report back to community
Fall	TACPAC 9 reviewing draft Stage 1&2 LWMP Report
Fall	TACPAC 10 recommend report to CVSC for submission to Min of Environment.

How to use Reclaimed Water?

Comox Valley
REGIONAL DISTRICT

Closing the Loop on Resource Recovery.

Resources are only truly “recovered” when they are actually ***reused.***

The ***engineering*** side of resource recovery is relatively straightforward.

Making ***productive use*** of the resources, especially water, is much harder.

Why is it so hard to use reclaimed water?

- Cost of ***producing*** the water
- Cost and logistics of ***conveyance*** to users
- Largest use – irrigation - is ***seasonal & weather dependent***
- The perceived "***ick factor***" about "recycled sewage"

How to resolve these issues?

- If there is ***enough*** water being used – ***and paid for-*** the costs become “worth it”
- ***Cannot change*** the fact that irrigation is a summer use
- Can change the perception of the ick factor through ***engagement***
- Can change the reality of the ick factor through ***appropriate treatment –*** make the water “fit for purpose”.

Today's challenge -

Identify "Users" and "Uses" of reclaimed water

If we can find enough of both, it might be "worth it" to do reclaimed water

What are the “Uses”?

The ***specific activities*** using the water e.g.:

- toilet flushing,
- landscape irrigation
- agricultural irrigation
- washing buses
- concrete mixing

Who are the “Users”?

The people and/or places that are doing the uses

e.g.:

- A city park
- Hotel
- Farm
- Airport

One **User** might have multiple **Uses**.

One **Place** might have multiple **Users**

The action statement

Use Reclaimed Water at Place by User for Use

Example:

Use reclaimed water at Airport by Airlines for aircraft washing.

One Place and/or User having Multiple Uses

Use reclaimed water at Airport by Airlines for;

- Aircraft washing.
- Flushing toilets
- Flushing toilets on aircraft
- Irrigating the grounds
- etc.

Exercise – Identify the Places

Use the Red notes

examples;

- Courtenay downtown
- Comox waterfront
- K'omoks First Nation
- Estuary Farm area
- Lazo Beach
- Airport
- Sandwick
- Other Locality– be specific e.g BC Ferry Terminal

Exercise – Identify the Users

Write down a **specific user –**real or potential- of reclaimed water. Concentrate on the ones in your area. Use the yellow notes

e.g;

- XYZ Hotel
- dairy farm
- hay farm
- golf course,
- widget factory,
- Comox Parks dept.
- Residential

Exercise – Identify the Uses

Write down a **specific use –**real or potential- of reclaimed water. Use the green notes

e.g.

- Irrigating hayfield
- Irrigating tomatoes
- Washing buses
- Washing boats
- Augmenting flow to the wetland, creek
- Flushing toilets
- Processing cowhides to leather

What to do with all this?

- We will compile and sort the Places, Users and Uses
- This will be reported back to the TACPAC with the study of reclaimed water
- The TACPAC can identify promising combinations that merit further study
- Some study may done by others e.g. economic development entity, DND, etc

Liquid Waste Management Plan

LONG LIST PUBLIC CONSULTATION

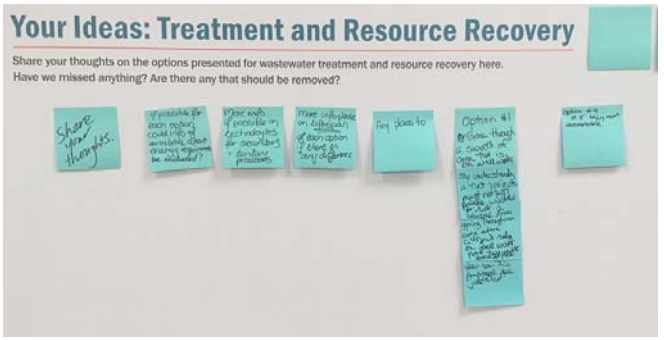
Comox Valley
REGIONAL DISTRICT

Phase 3 Goals

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Provide info on options and planning stage	Obtain feedback on alternatives and decisions			

Engagement Summary

Phase 3 Info Sessions



Themes of Feedback

Protection of the foreshore

High treatment standards

Consider the cost

Comox 2 opposition

Next Steps

Review and rank Shortlisted Options:

- February (TBD) Present Long list options to KFN Chief and Council
- May 29 + 30 (tentative)

  Workshops in Courtenay & Comox
- May (TBD) Workshop for KFN community
- April/May (dates TBC)

  Online Consultation: Connect CVRD

LWMP Public Consultation Plan

QUESTIONS?

Comox Valley
REGIONAL DISTRICT

Long List Options - Conveyance

Need to decide the Long List
[WSP]

Long List Options – Treatment

Need to decide the Long List
[WSP]

Long List Options – Resource Recovery

Need to decide the Long List
[WSP]

Technical Update

1. Understanding Cost Estimates
2. Conveyance Hydraulics

[WSP]

Understanding Engineering Cost Estimates

Understanding Engineering Cost Estimates

Costing "Catch-22"

- Cost estimates are needed to filter/rank options
- Insufficient options development to define costs
- Addressed through cost estimate Classifications

Definitions and Terms

- Class A to D

  Former Treasury Board of Canada cost classification definition

- Class 1 to 5

  Association for the Advancement of Cost Engineering (AACE) definitions

Class A to D Estimates

Project Development

Table 1 – Cost Estimate Classification Summary – Estimate Attributes					
	Primary Attribute	**Secondary Attributes**			
Estimate Classification	**Project Definition**	**Intended Purpose**	**Methodology**	**Level of Precision**	**Preparation Effort**
Class A	High (completed working documents)	Compliance with effective project approval (budget)	Measured, priced, full detail quantities	High	High
Class B (Substantive)	Medium (completed design development)	Seeking effective project approval	Mainly measured, priced, detail quantities	Medium	Medium
Class C (Indicative)	Low (project plan)	Seeking preliminary project approval	Measured, priced, parameter quantities, where possible	Low	Low
Class D	Lowest (described solutions)	Screening of various alternative solutions	Various	Lowest	Lowest

Class 1 to 5 Estimates

Project Development

	Primary Characteristic	*Secondary Characteristic*		
ESTIMATE CLASS	**MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Level of Accuracy

Class ‘D’ or ‘5’

-20% to +100% variability

Class ‘C’ or ‘4’

-15% to +50% variability

Class ‘3’

-10% to +30%

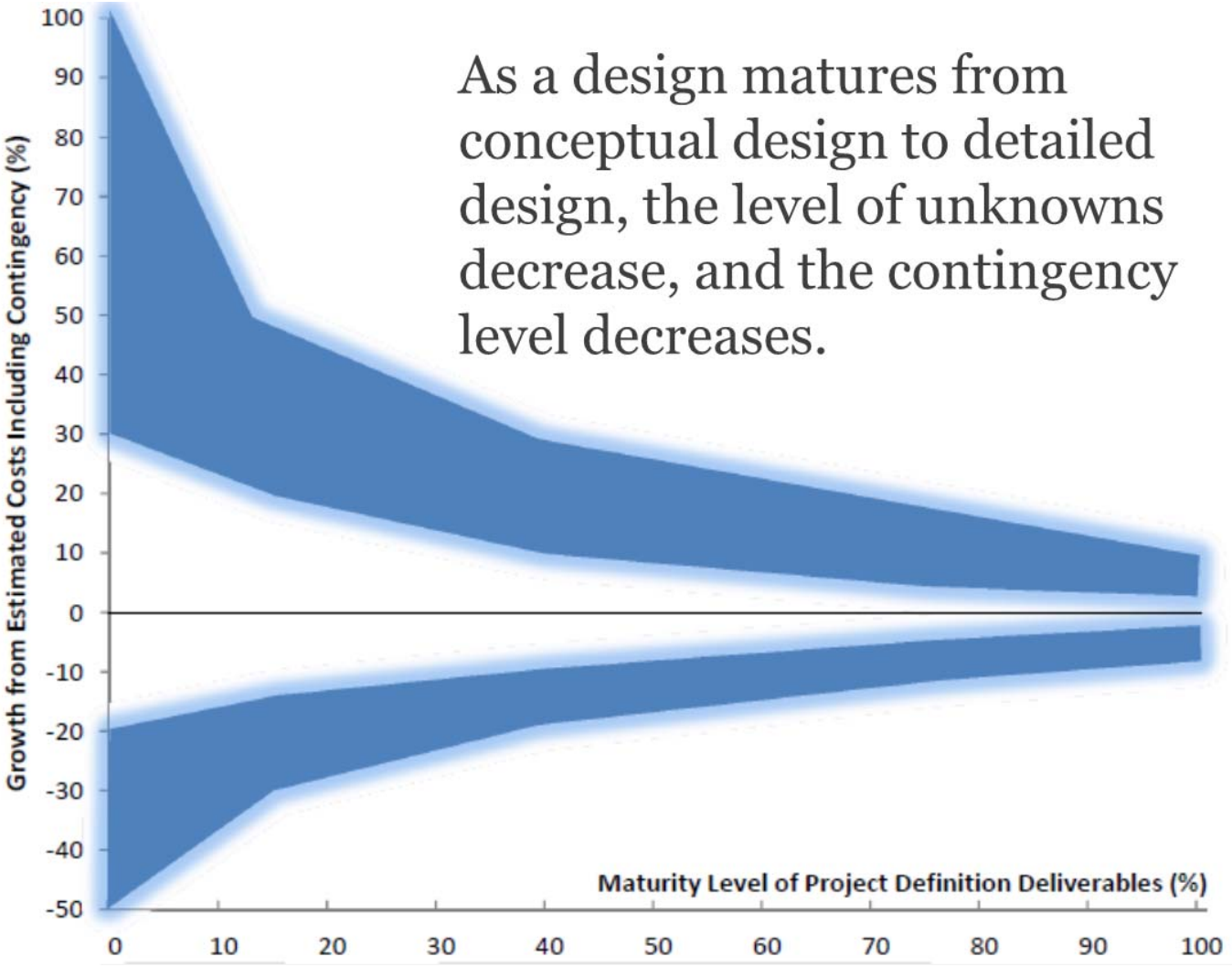
Class ‘B’ or ‘2’

-5% to +20%

Class ‘A’ or ‘1’

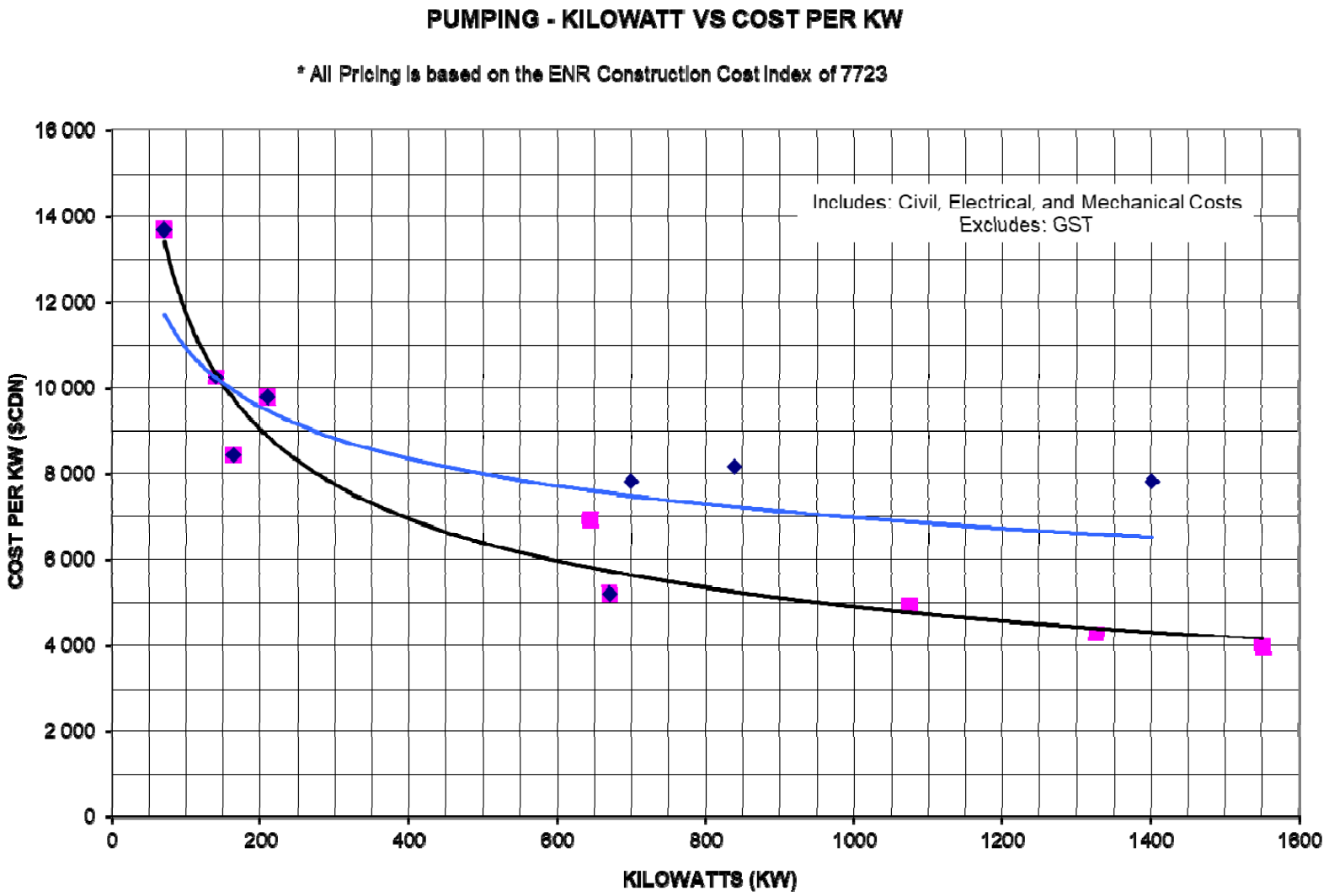
-3% to +15%

Level of Accuracy



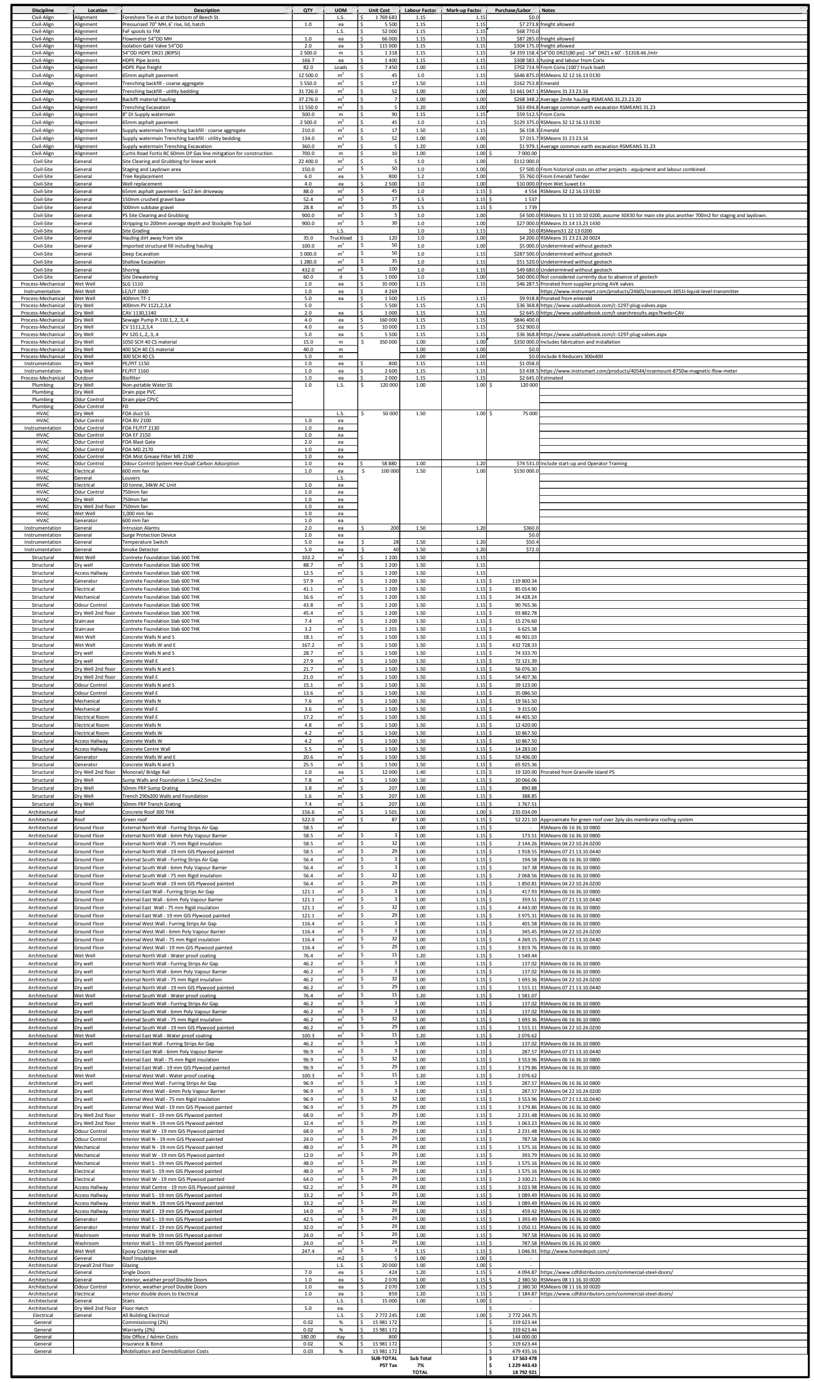
Source: Association for the Advancement of Cost Engineering (AACE)

Cost Curves


PUMPING - KILOWATT VS COST PER KW
* All Pricing is based on the ENR Construction Cost Index of 7723
Includes: Civil, Electrical, and Mechanical Costs
Excludes: GST
COST PER KW ($CDN)
16 000
14 000
12 000
10 000
8 000
6 000
4 000
2 000
0
0
200
400
600
800
1000
1200
1400
1600
KILOWATTS (KW)

Detailed Estimates

- Construction estimates typically contain hundreds of line items
- Anticipate a ±20% spread even at tendering



Cost Estimating Summary

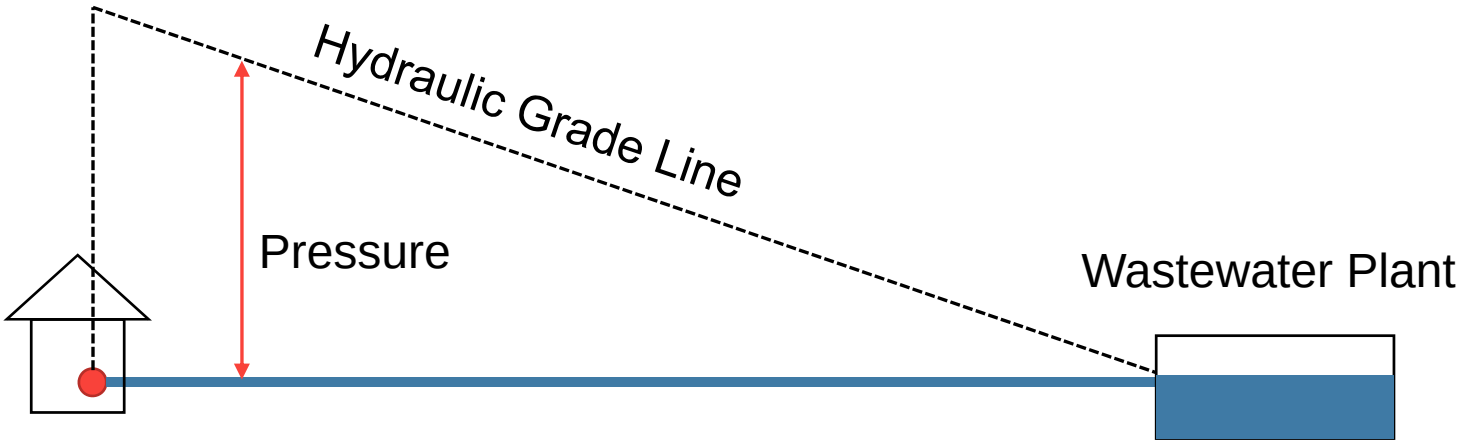
- Costs derived from
  - Analogy to other projects
  - Cost models (i.e. flow vs cost)
  - Unit rates (costs per meter)
- Relative ranking of costs
  - Comparison between options
- Must be refined as the Project advances

Hydraulics in Pumped Systems

Hydraulics in Pumped Systems

- Keys Words
  - *Forcemain – a pressurized sewage pipe*
  - *Gravity main – a non-pressurized pipe open to the atmosphere (typically at manholes)*
- Hydraulic Grade Line (HGL)
  - *Hydraulic grade is the static energy in a pipe system, including the sum of pressure and elevation*
- Energy Grade
  - *Similar to HGL but includes kinetic energy (velocity). Generally minor in water/wastewater systems.*
- In gravity mains:
  - *Pressure = 0*

Hydraulics in Pumped Systems



For meeting # 6…

Thursday March 21, 9-12

For each component;

- Review conceptual studies of Long List options
- Evaluate
- Settle on the Short List for detailed study

Round Table

[Allison]

Thank You!