

# Esquimalt Graving Dock Waterlot Remediation

Design, Contracting and  
Construction Challenges

**Presented by:**

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Environmental Services  
Tervita Corporation



# TIMES COLONIST

**Tainted soil** in Highlands “**horrifying**”;  
Residents raise new concerns about  
groundwater contamination



# Internal EGD Project Report

“The physical characteristics of the dredgeate change significantly in the 48 hours between dredging and offloading.

***We need to change our approach.”***

Myles Makortoff  
Senior Project Manager  
Esquimalt Graving Dock



# TIMES COLONIST

**Esquimalt seeks compensation for heavy truck traffic during Graving Dock project**

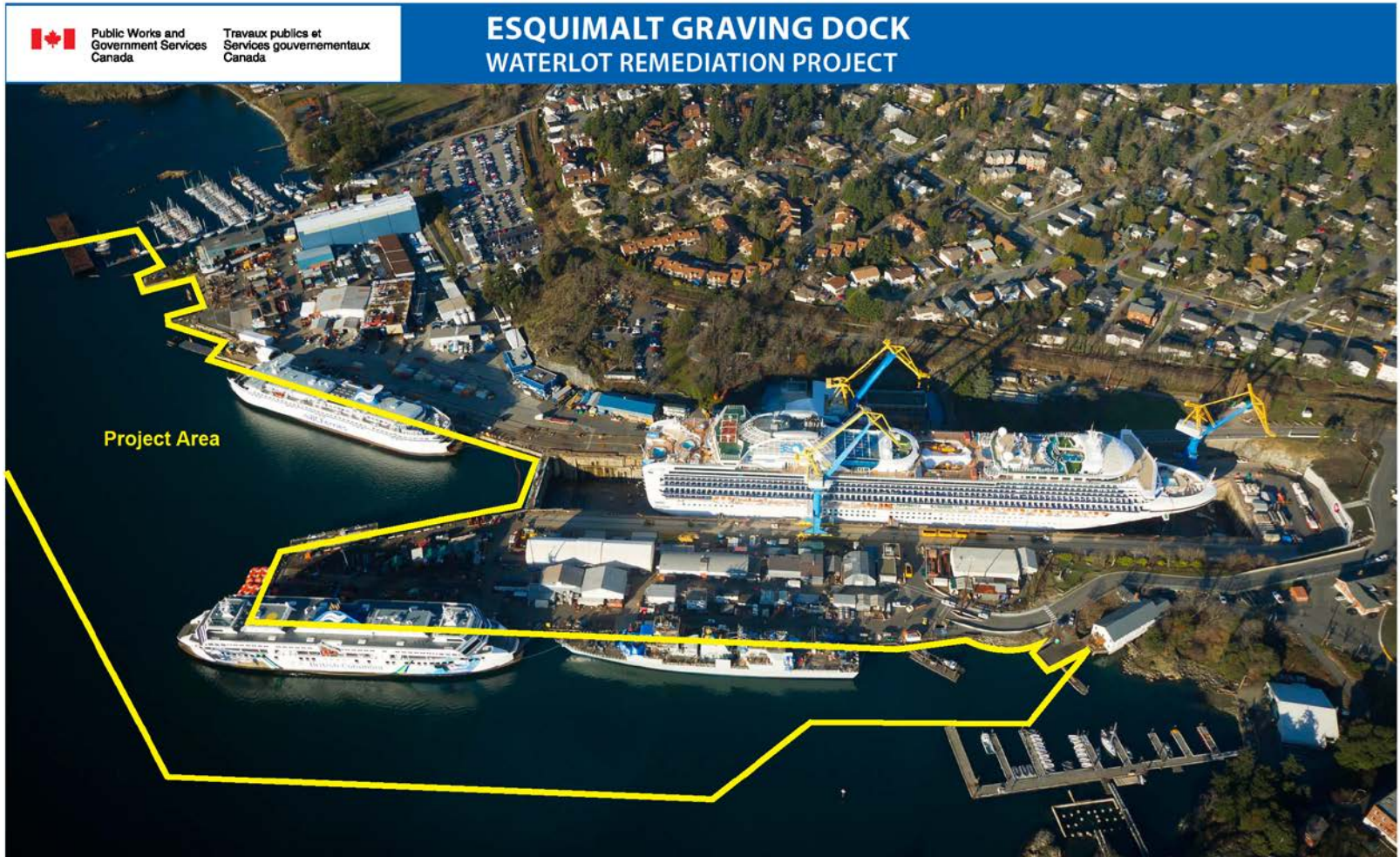


# History of Esquimalt Graving Dock

- Southwestern tip of Vancouver Island in Esquimalt, BC
- PWGSC owned & operated since 1927
- Largest shipbuilding facility on Canada's Pacific Coast



# Largest Project in B.C. in 2013



Canada

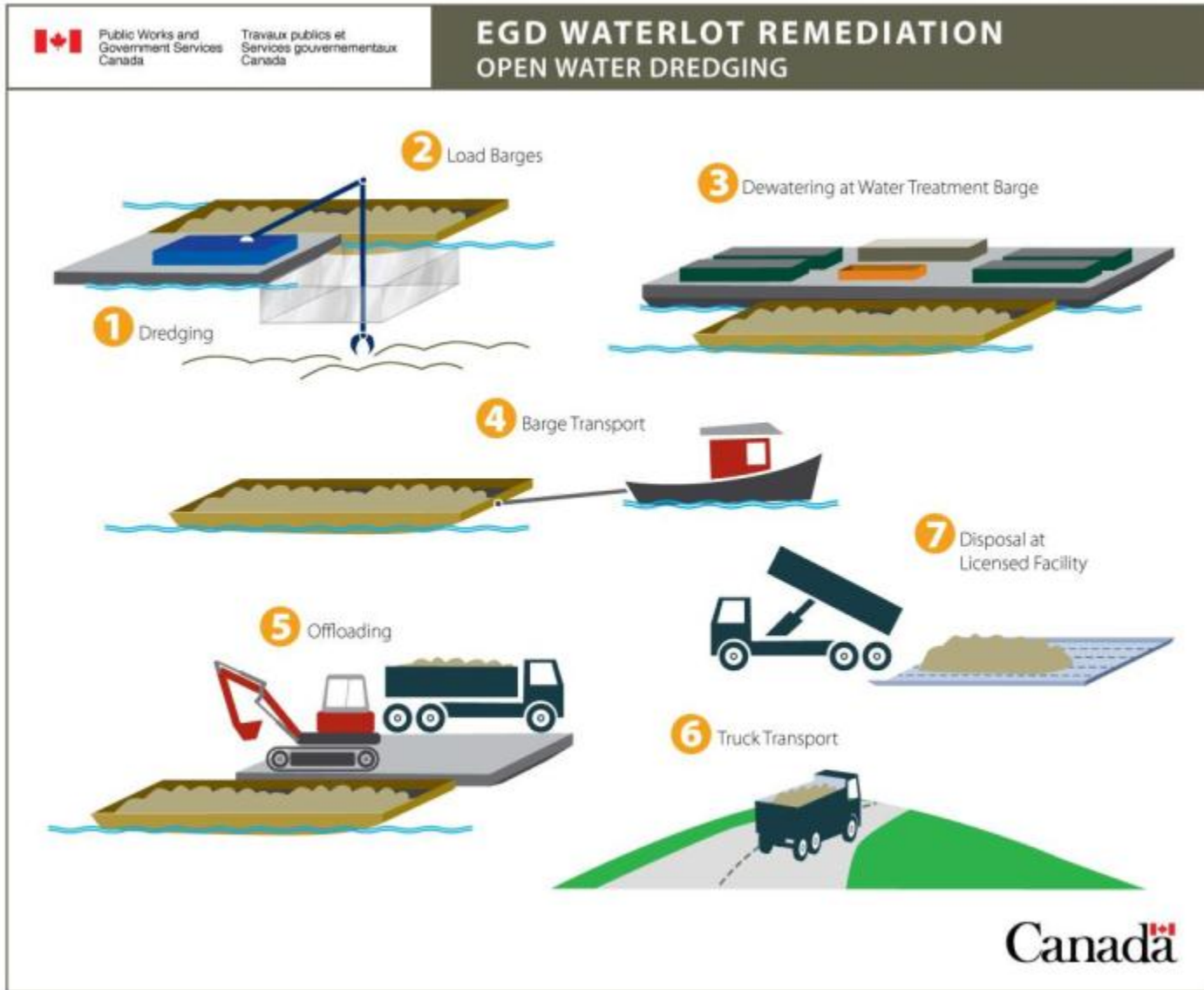


# The Problem

- 150,000 m<sup>3</sup> metals and PAH impacted sediment
- Prescribed sequence – 11 zones over 9 hectares
- No interruption of drydock activity – schedule driven
- Associated restoration and capping activities.

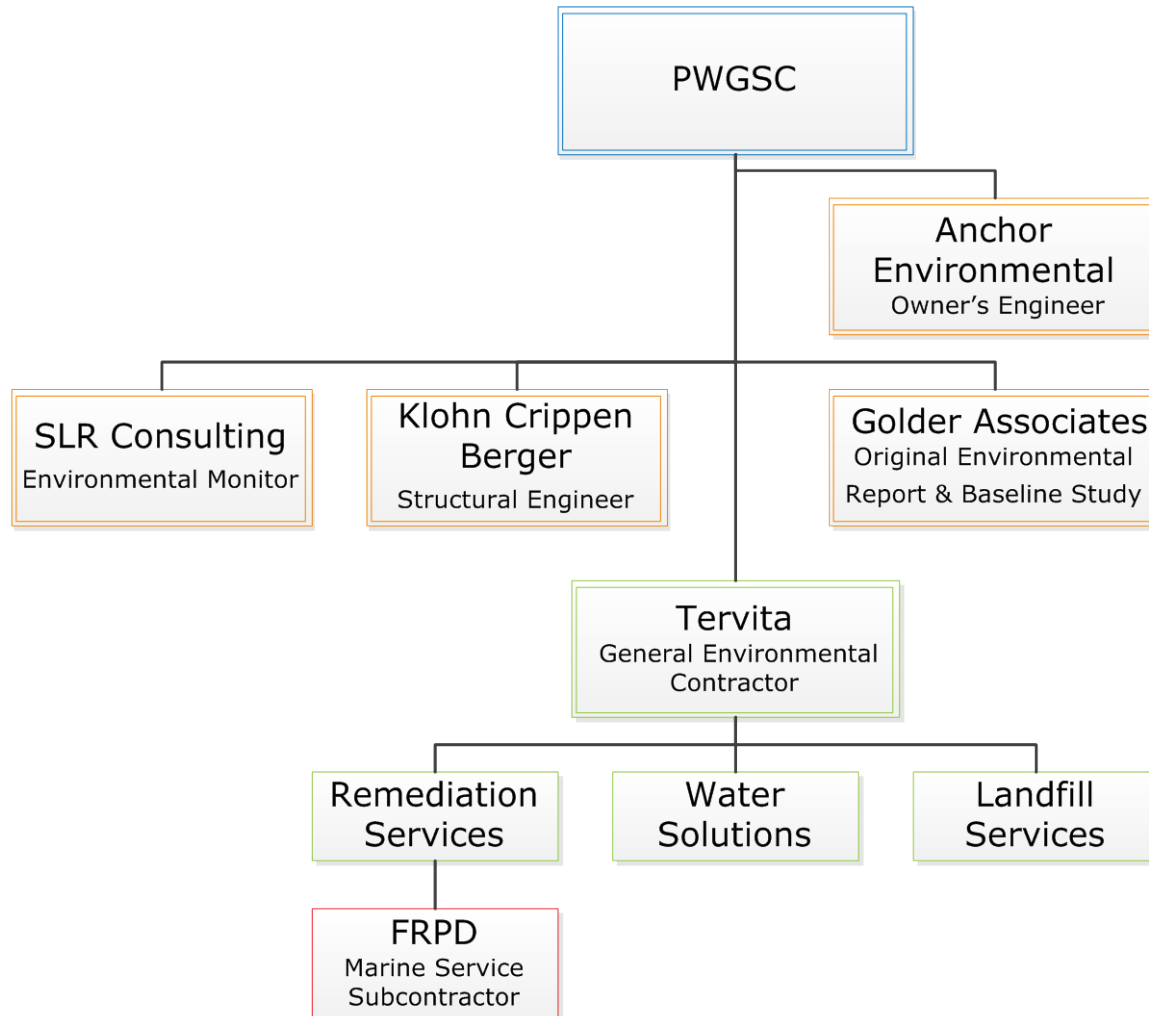


# The Solution





# The Project Team



# Dredging and Barge Loading



# Dredging and Barge Loading

## Three Dredging Methods

- Land based excavation  
– 4,000 m<sup>3</sup>
- Mechanical dredging with a clamshell  
- 145,000 m<sup>3</sup>
- Diver assisted suction dredging for sensitive structures – 50 m<sup>3</sup>



# Dredging and Barge Loading

## Dredging by Zone

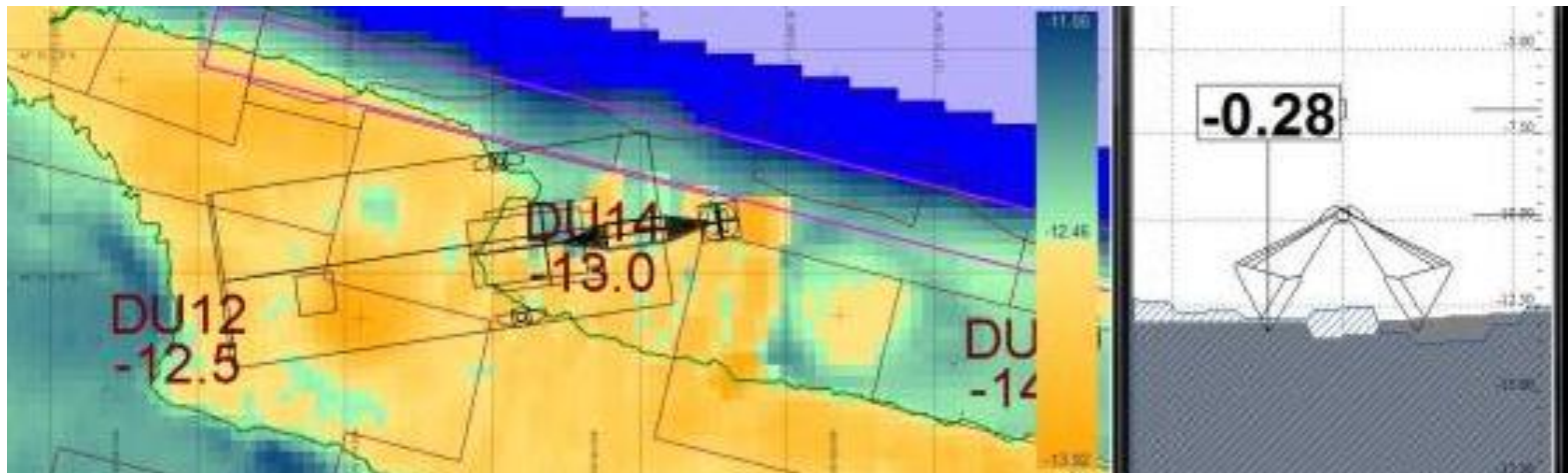
- Sequential design
- Work two marine derricks concurrently
- Adapt sequence to EGD operational requirements
- Comply with DFO permit and restrictions
- CFSA Marina protection



# Dredging and Barge Loading

## Marine Derrick and Bucket Positioning

- Real Time Kinetic (RTK) Receivers
- Crane and Barge Positioning (Qinsy)
- Electronic depth control via line counters
- Surface updated daily from multi-beam survey and continuous from derrick software



# Dredging and Barge Loading

## Water Quality Management

- Silt curtains (6m deep)
- Sealed material barges
- No passive dewatering
- Environmental clamshell bucket
- Conducted under project Environmental Protection Plan



# Barge Dewatering and Water Treatment



# Barge Dewatering and Water Treatment

## Dewatering

- High turbidity fluid recovered from dredgeate
- Debris and sludge
- High variability in dredgeate characteristics
- Design modified





# Barge Dewatering and Water Treatment

## Treatment

- 2 water process barges
- 3 days of combined storage on and below deck
- On-board power generation system
- Proprietary process for solid/liquid separation



# Barge Dewatering and Water Treatment

## Treated Water Discharge to Marine Environment

- Requirement: 40mg/L TSS (20 NTU)
- Actual: 2 NTU average
- Discharge based on inline turbidity analyzer
- Correlated to risk based criteria



# Barge Transport and Offloading



# Barge Transport and Offloading

## Offloading

- Solidification of dredgeate
- 110 trips per day
- Secondary containment system
- Wheel wash for decontamination
- Storm water control berms



# Upland Transportation and Disposal

## Offload Site to Highest Landfill

- Haul route planning
- Safety Monitoring
- Environmental Monitoring
- Community communications



# Upland Transportation and Disposal

## Disposal at Tervita Highwest Landfill



# Summary

## Managing Change in the Field

Do you have the budget and the skills to adapt in the field?



# Summary

## The Right People

Will the owner and other stakeholders have confidence in your team?





# Summary

## Communication Management

Does your communications team  
have the experience and are they  
ready?

***“Plan for the worst, hope for the best”***





VICTORIA, BRITISH COLUMBIA (March 28, 2013)

**Rod Friesen**, Director, PWGSC, **Cameron McLean**, Tervita ES President,  
and **Kerry-Lynne Findlay**, MP for Delta- Richmond East



# Conclusion

