



Unique Technical Issues and Solutions related to Redeveloping a Major Urban Shopping Centre in Victoria

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Introduction

Why redevelop a mall?

- I. Stay competitive
- II. Neighborhood revitalization (in co-operation with municipality).
- III. Attract profitable, sustainable tenants



BUT ... legacy environmental issues can impede redevelopment

Old to New.....



Challenges and Objectives

Technical

1. Drinking Water standards
2. Physical obstructions
3. Zinc in soil (CL+)
4. GW impacts at property lines
5. Soil impacts at property line

Construction

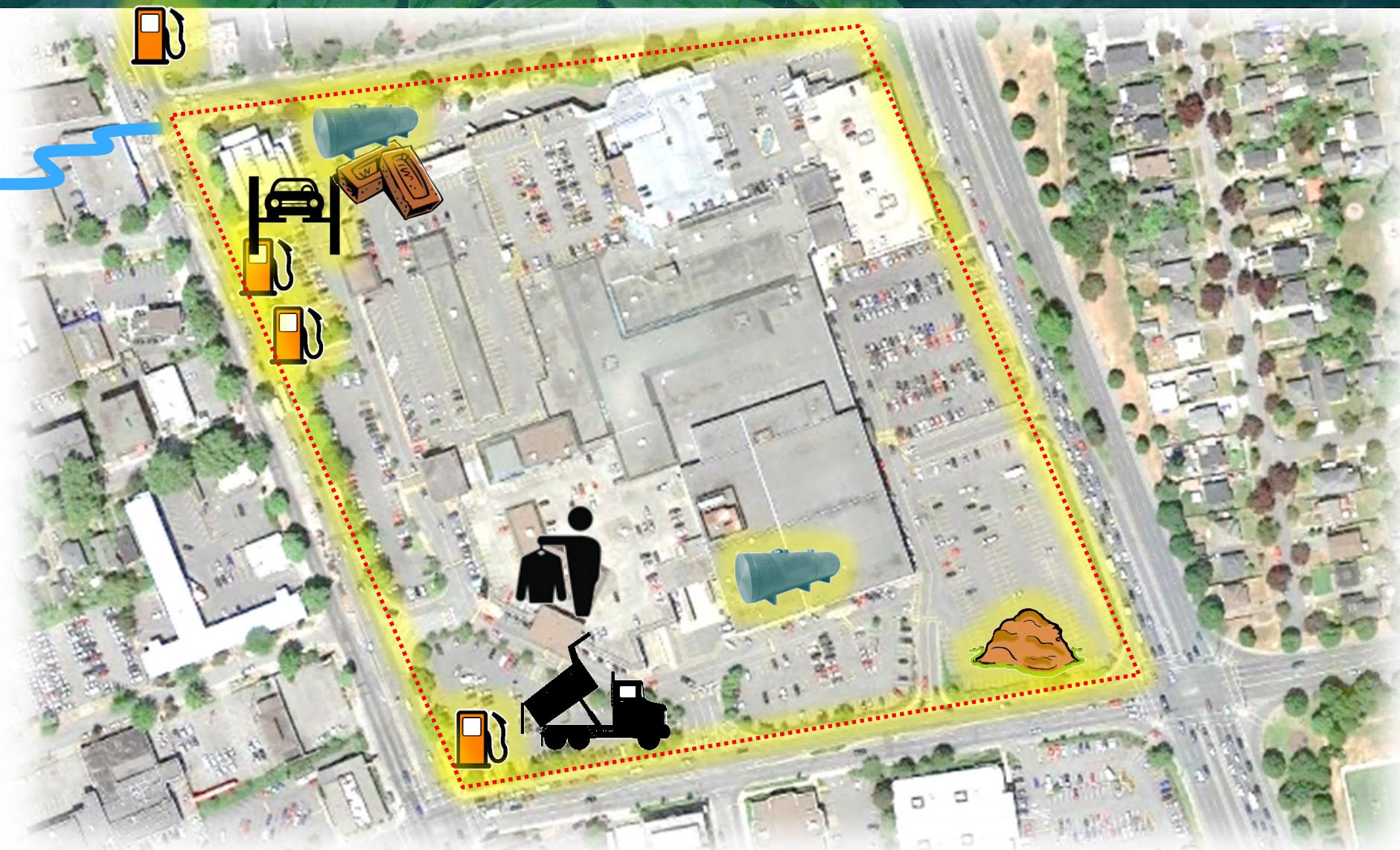
1. Development Permit needed
2. Parking: above or below ground?
3. Caisson and Piling design

Objectives:

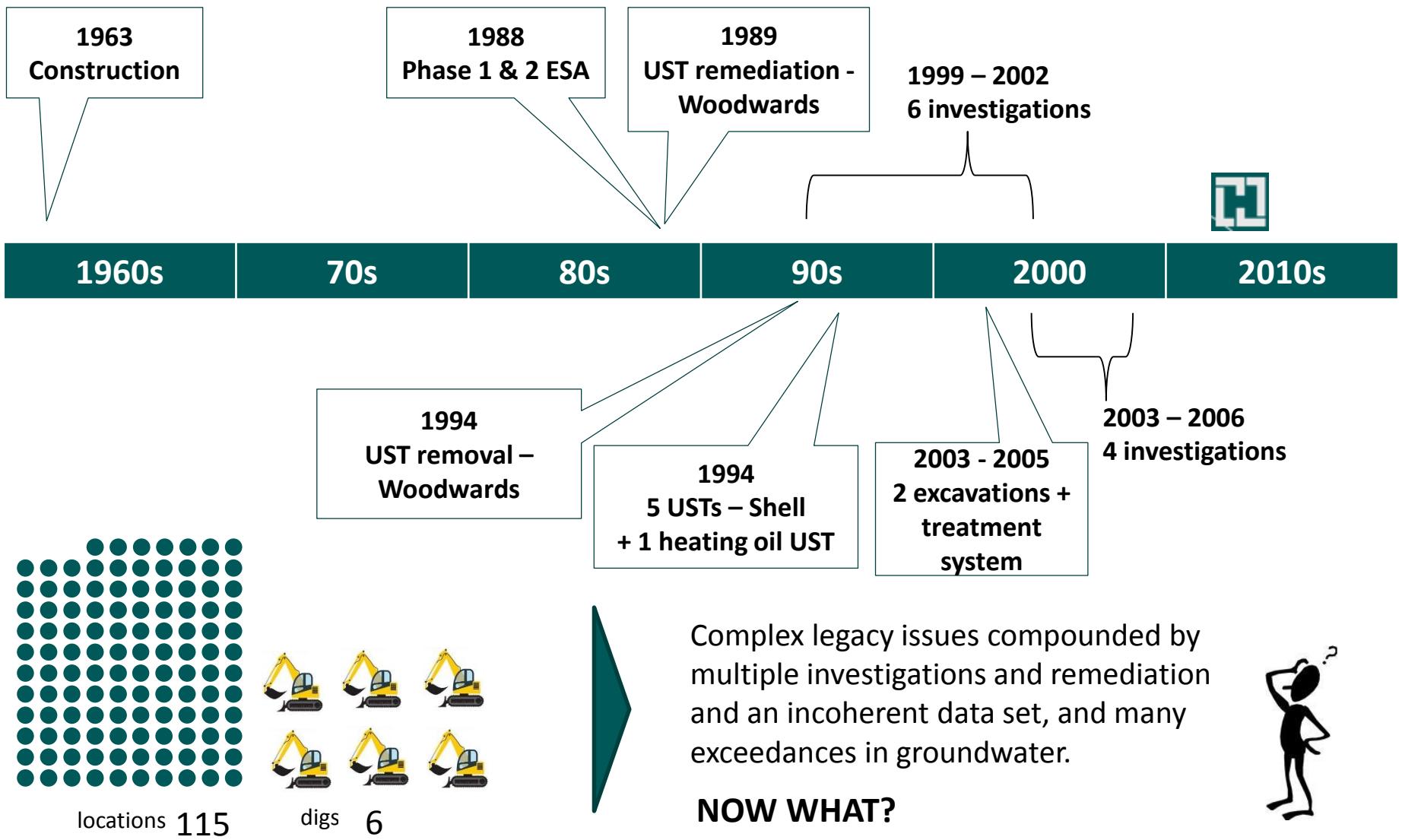


- 1) Obtain Closure
- 2) Greenlight to Redevelop

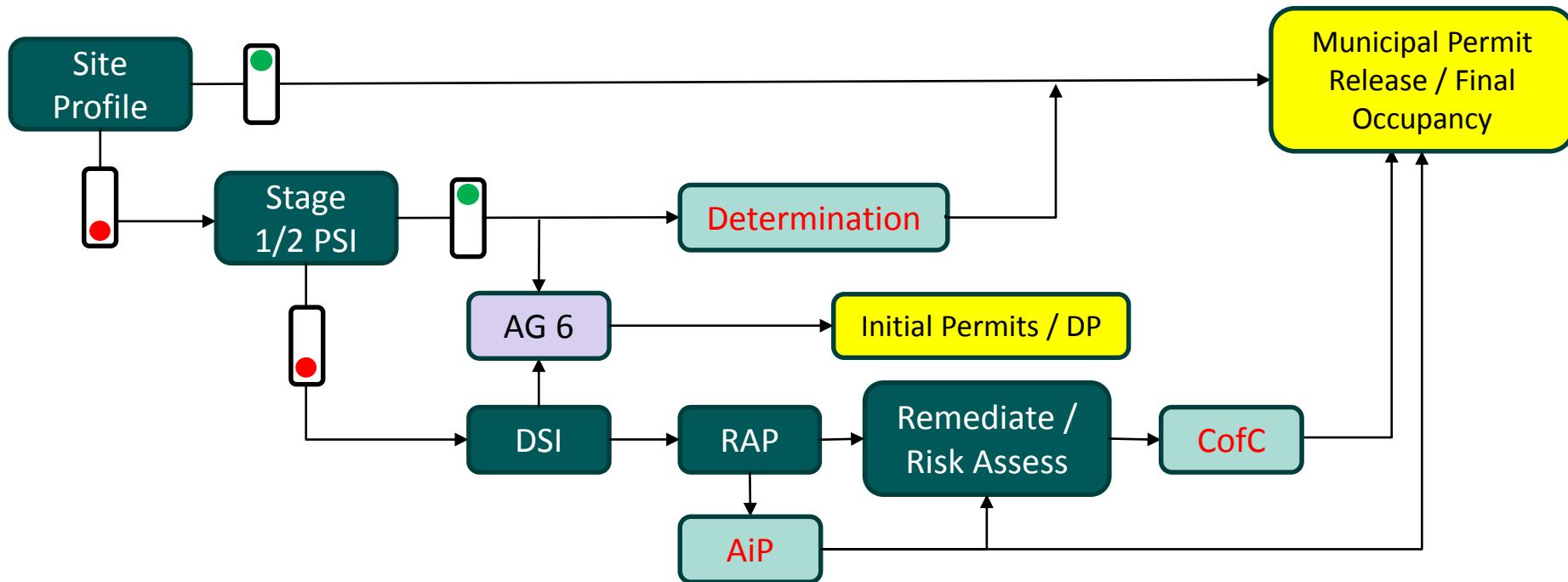
Site Layout / Challenges



Timeline

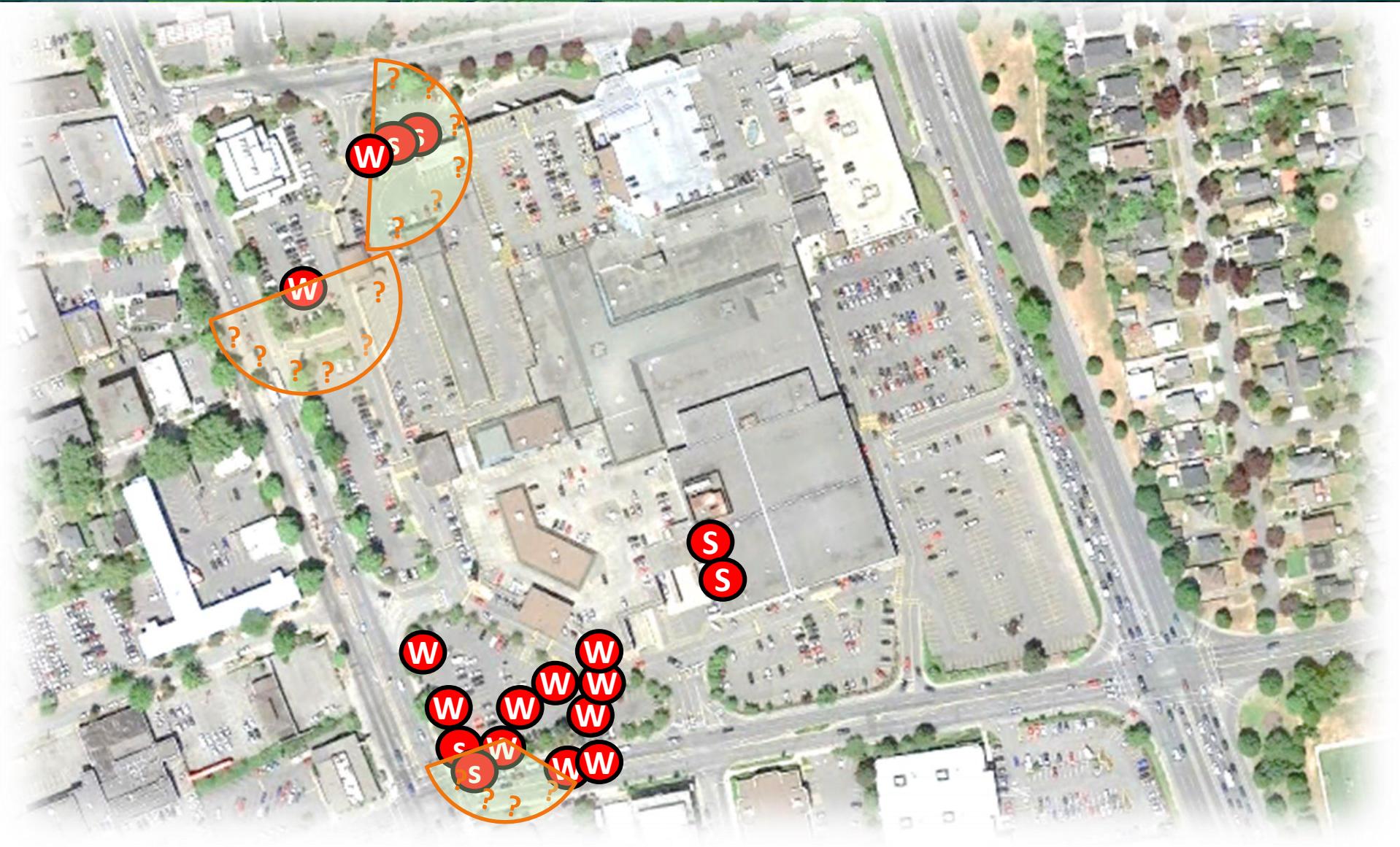


Regulatory Landscape



BC	Stage 1 / 2 PSI	DSI	Remediation	MOE Instrument
Alberta	Phase 1/2 ESA	Supp'l Phase 2	Phase 3	Remediation or Reclamation Certificate

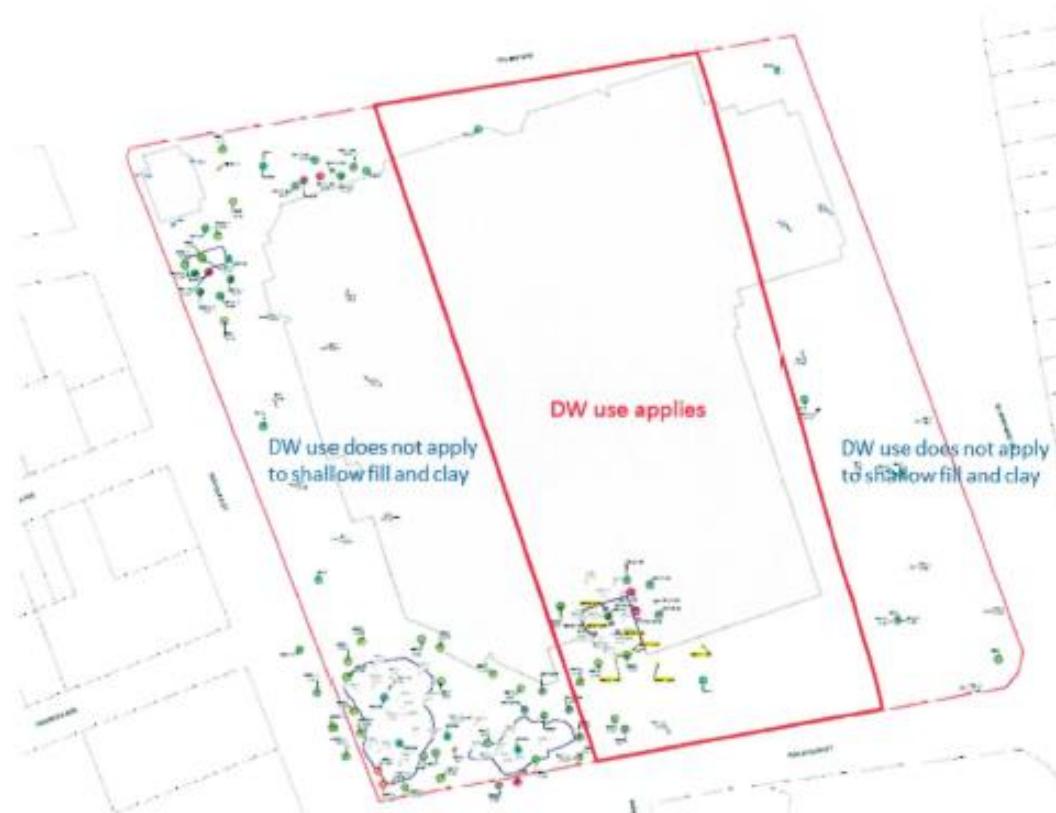
Major Obstacle: DW Standards



Groundbreaking DW Determination

- 4 -

Figure 1. Water Use Boundary



Challenge & Solution: Physical Obstacles

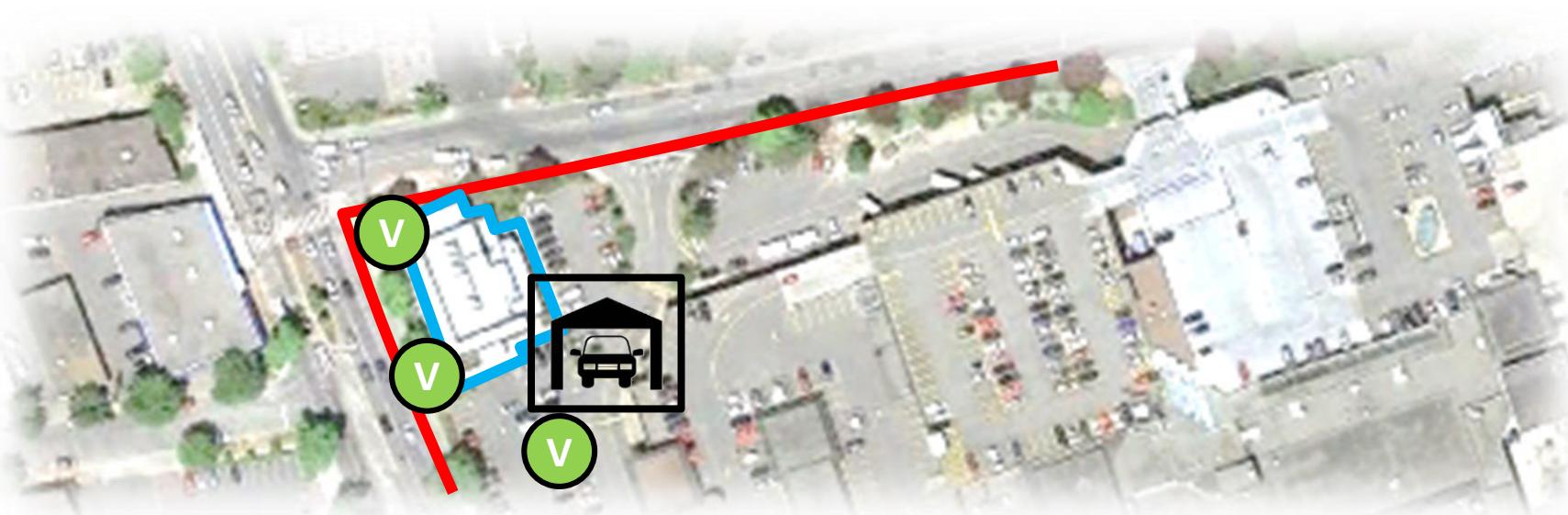
- Concrete slab prevents drilling at APEC
- Current building prevents drilling down-gradient of APEC



Creative SV probe scheme



Substitute soil vapour data for
soil, groundwater data



Challenge & Solution: Delineating Zinc

- Zinc exceeding CL in soil
- Not delineated to the south
- Costly to drill inside mall

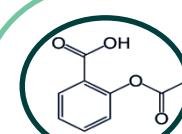


Identified mall and bedrock as physical barriers and argued delineation complete



Challenge & Solution: Groundwater at PL

Hydrocarbon impacts in on-site and off-site wells adjacent to property lines



Evaluated contaminant characteristics



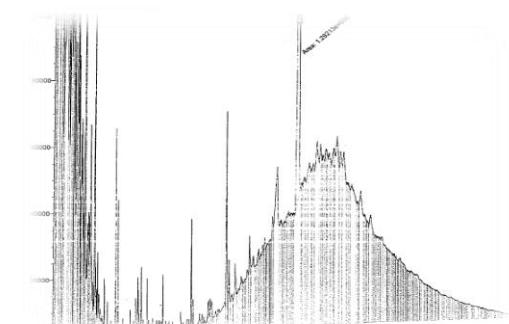
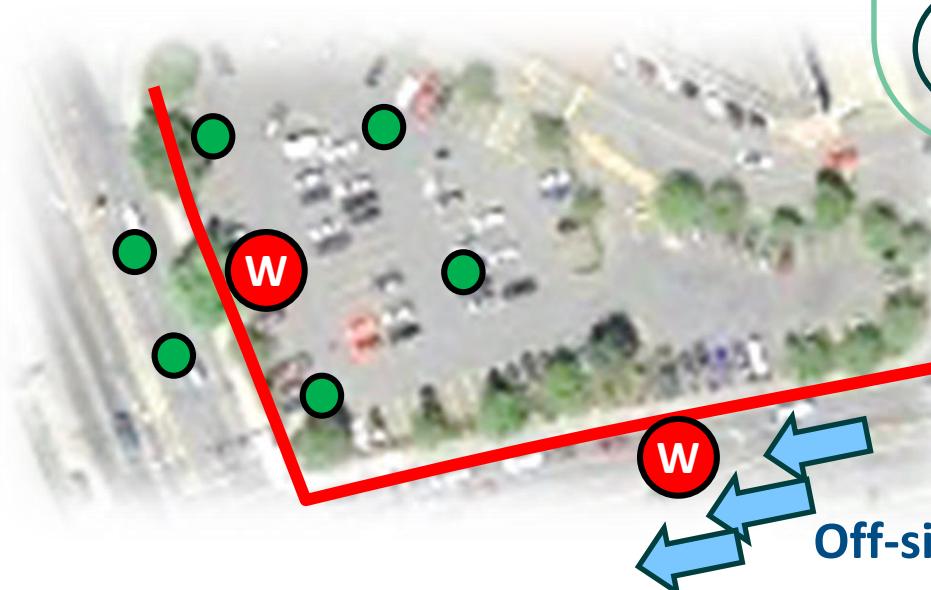
Used existing MW network



Avoided off-site drilling



Avoided Off-site Management Area



Challenge & Solution: Soil Impacts in SW Corner

- Historically non-exceeding soil sample became an exceedance under current standards. Surprise!



Replaced soil sample as per
TG12

Avoided off-site drilling



Challenge & Solution: Development Permit

- Schedule for start of construction versus Instrument process



Hope for the best, plan for the worst

Address audit uncertainty
- apply for AG6 prior to CofC submission

AG 6



CofC
Submission

AUDIT !!!

Development
Permit

Construction Considerations

You would like to change *what*?



SLRA no longer sufficient

↑ Cost (\$\$)

CofC must wait for parkade

↑ Delay

Need CSRA

↑ Cost (\$), ↑ Delay

Limited hydrocarbon contamination in soil

BUT

Likely widespread salt exceeding standards

- Requires disposal at permitted landfill
- Limited nearby disposal options
- ↑ Cost (\$\$\$\$\$)

Project Summary

- Started with 116 historical locations + 6 excavations
- Filled in data gaps
- Limited the applicability of DW standards
- AG6
- CofC submission



Development Permit



CofC - any day now !!



Thank you. Questions?

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