



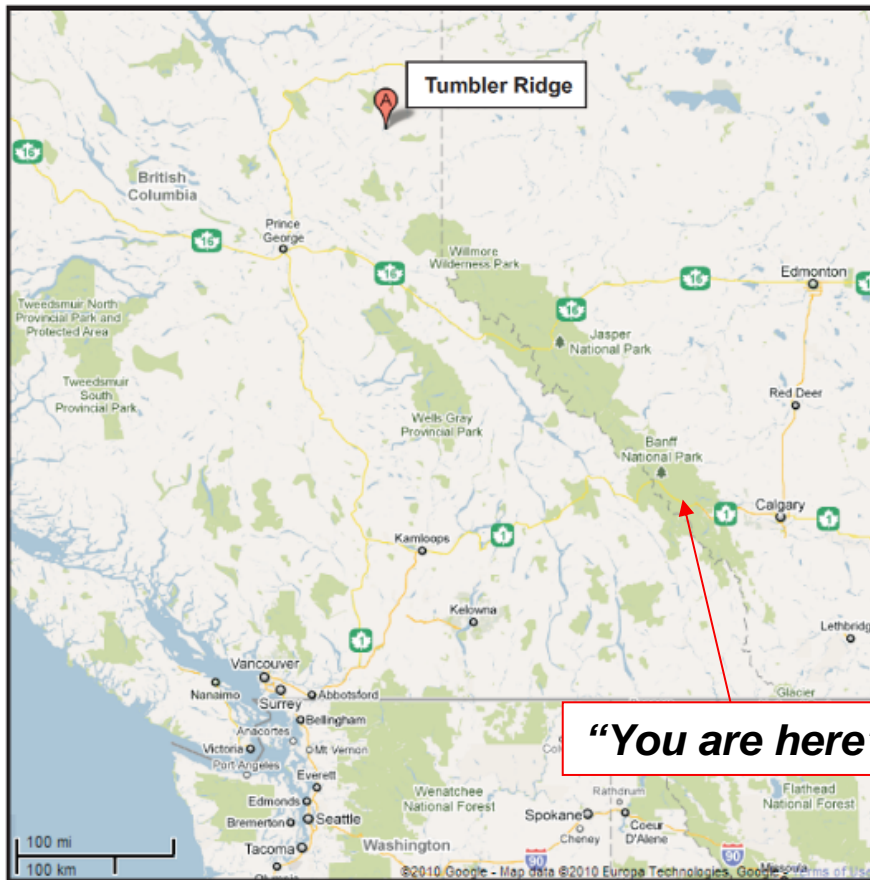
Aquifer Protection Planning in the District of Tumbler Ridge

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Introduction

- The District of Tumbler Ridge is in northeast BC.



- Around 3,300 residents
- Abundant natural resources
- Groundwater used for drinking
- Residents and industry share water and sanitation systems
- Two shallow, granular aquifers:
 - four supply wells;
 - up to 60 L/s yield;
 - they may be GWUDI.

Simplified Conceptual Catchment Outline

Two basins:

Flatbed Creek
(500 km²)

and

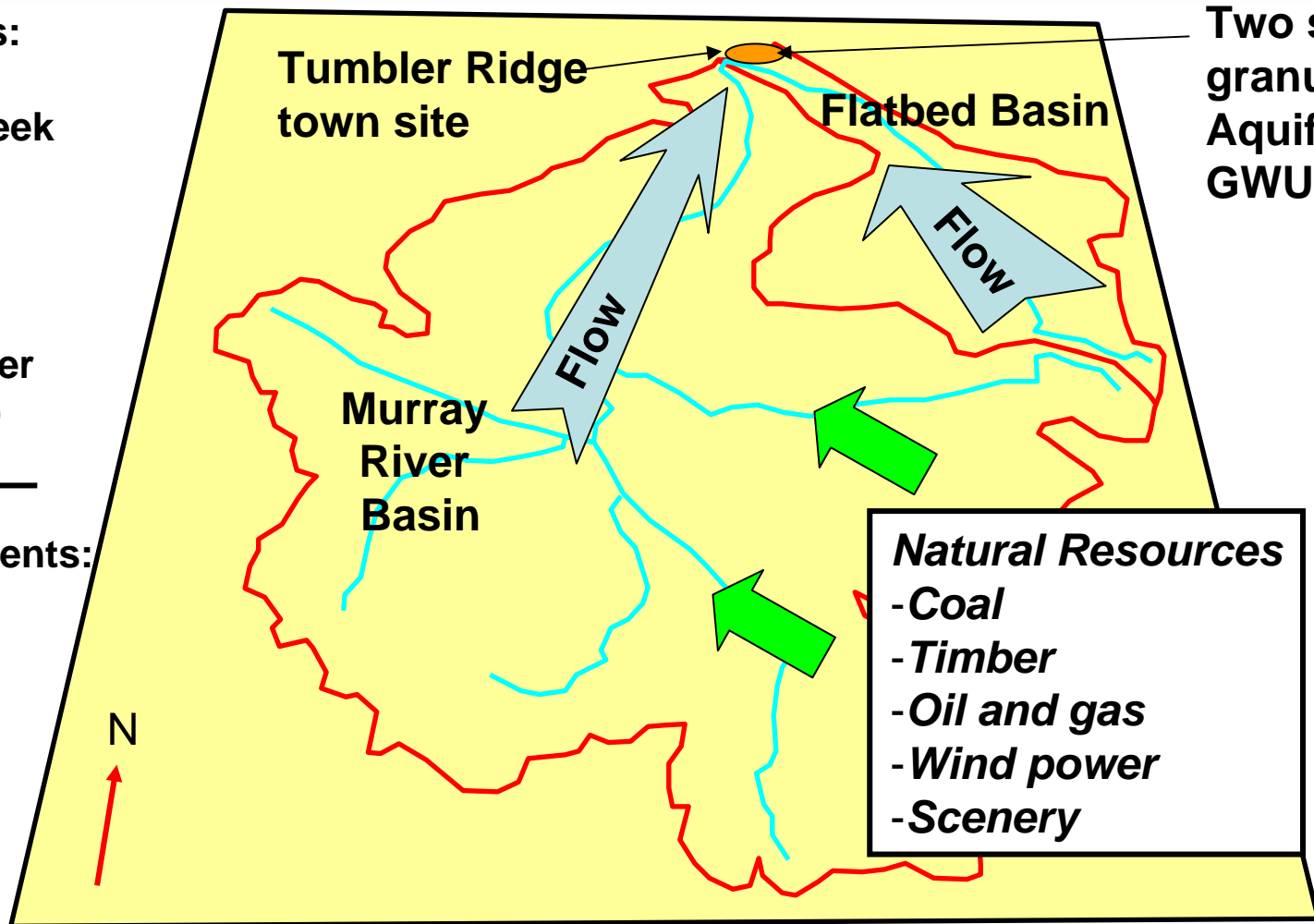
Murray River
(2,400 km²)

Aquifer extents:

1.7 km²

and

2.5 km²



Scope of Work

To prepare a three-stage Aquifer Protection Plan to:

- **(1a) Characterize aquifers.**
- **(1b) Define catchment land use.**
- **(2) Test for GWUDI.**
- **(3) Identify risks and plan for the future.**



Stakeholders

- **District residents and administration.**
- **Local industries and commercial operations.**
- **Regulators.**
- **Previous workers.**



Stage 1: Problems and Approaches

Two basic questions, and our approach:

- Do we know our aquifers? – *data gap analysis, field visit*
- What is the land use pattern? – *field visit, interviews*



Key Element #1: Historical Understanding



Woolwich Reach, c. 1750

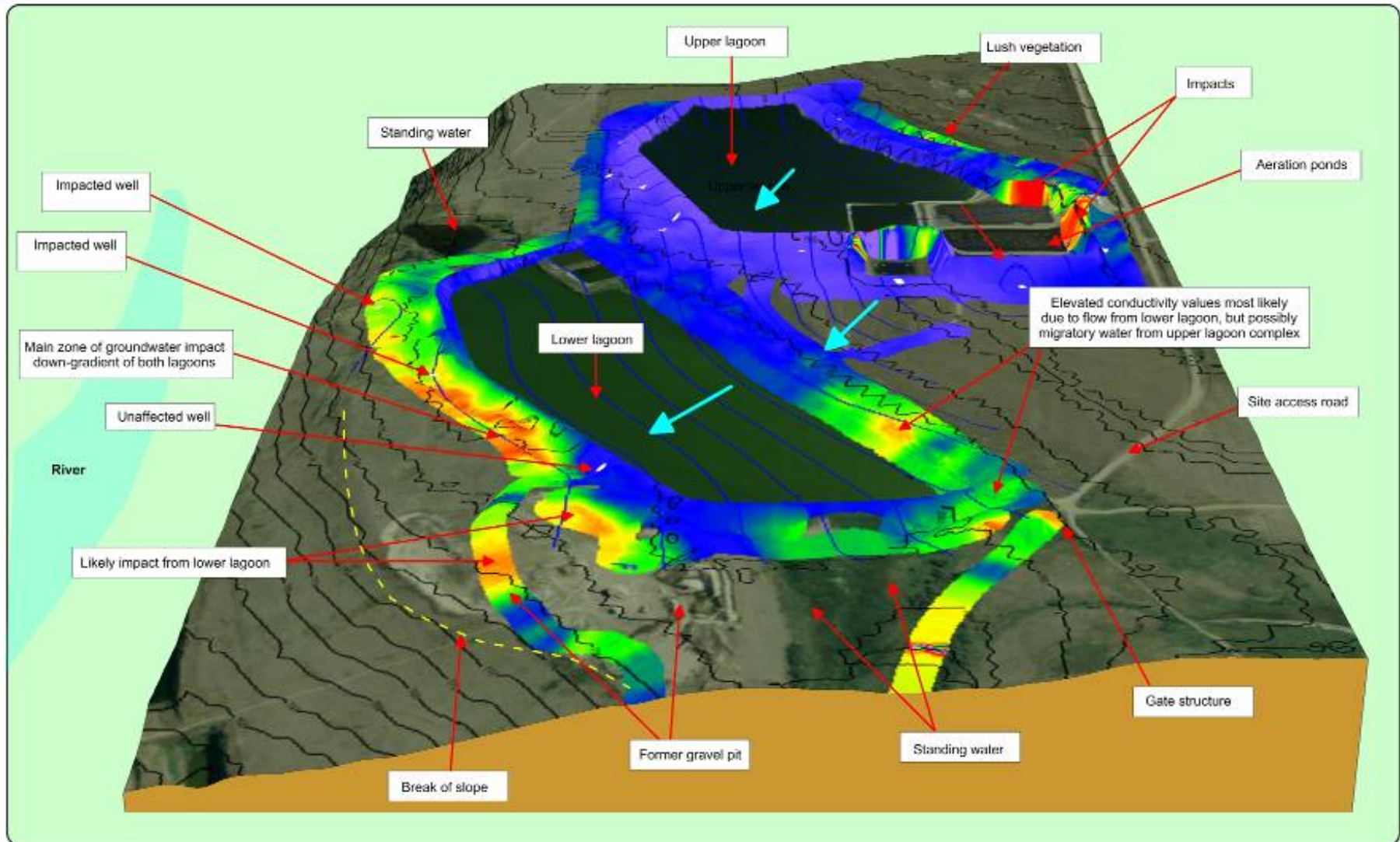
Woolwich Arsenal

“Understand your site – or else....”

Mistakes waiting to happen

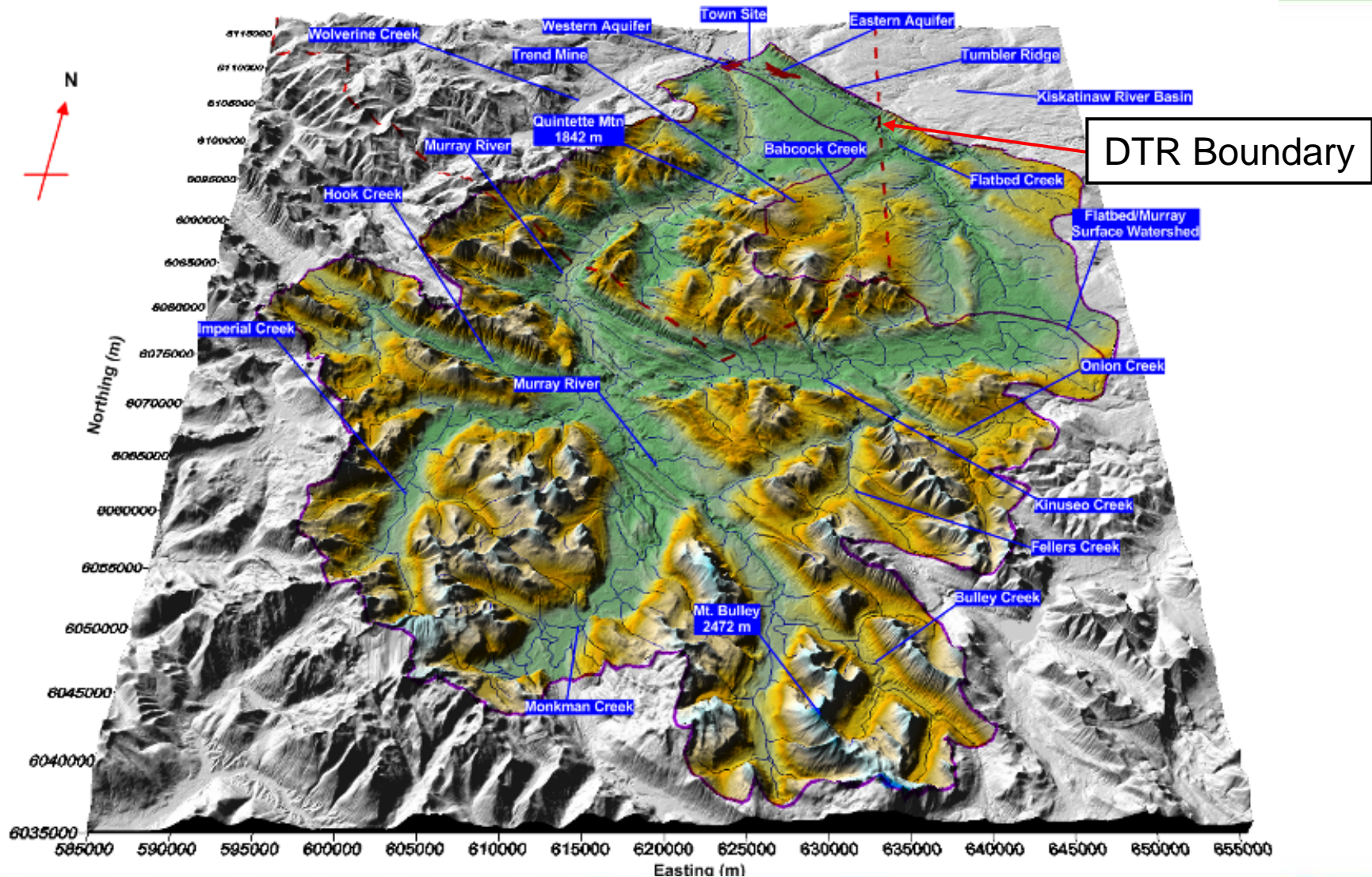


Key Element #2: Data Integration



- Needed a spatial framework for data interpretation
 - NTS sheets (12)
 - Government topo data (24 DEMs)
 - High-resolution aerial topo surveys
 - High-res and low-res imagery
 - iMapBC aquifer and drainage plans
 - Geological maps
 - Superb digital resources from DTR (Alissia)
 - BC Mines plans

Digital Model Supporting Interpretation



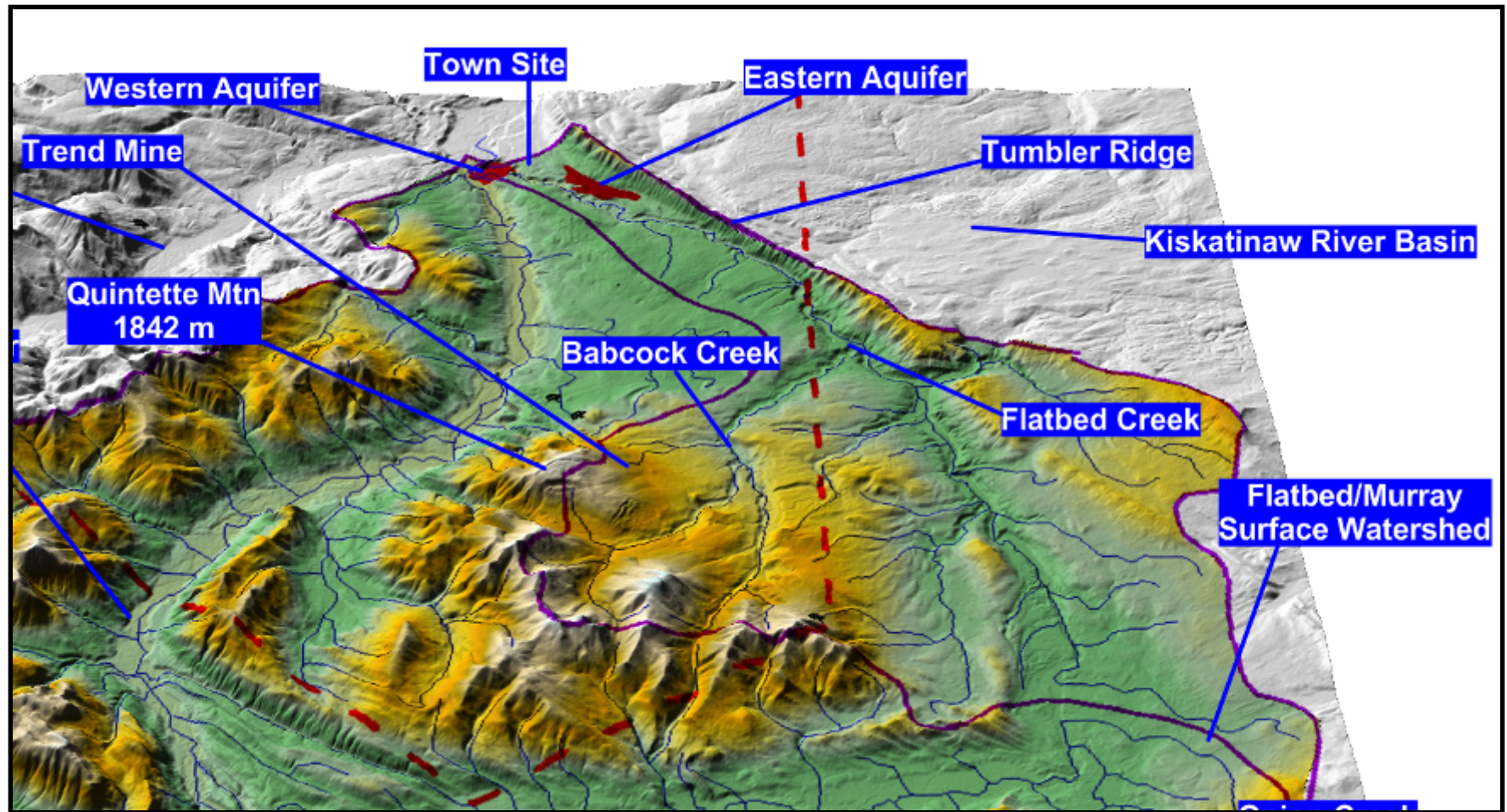
Filling The Framework

Now we had a system, so we dusted off the files. But....

- With age comes confusion.
- Some wells are like criminals – they have aliases, and they disappear.
- “Why on Earth did they do *that*?”

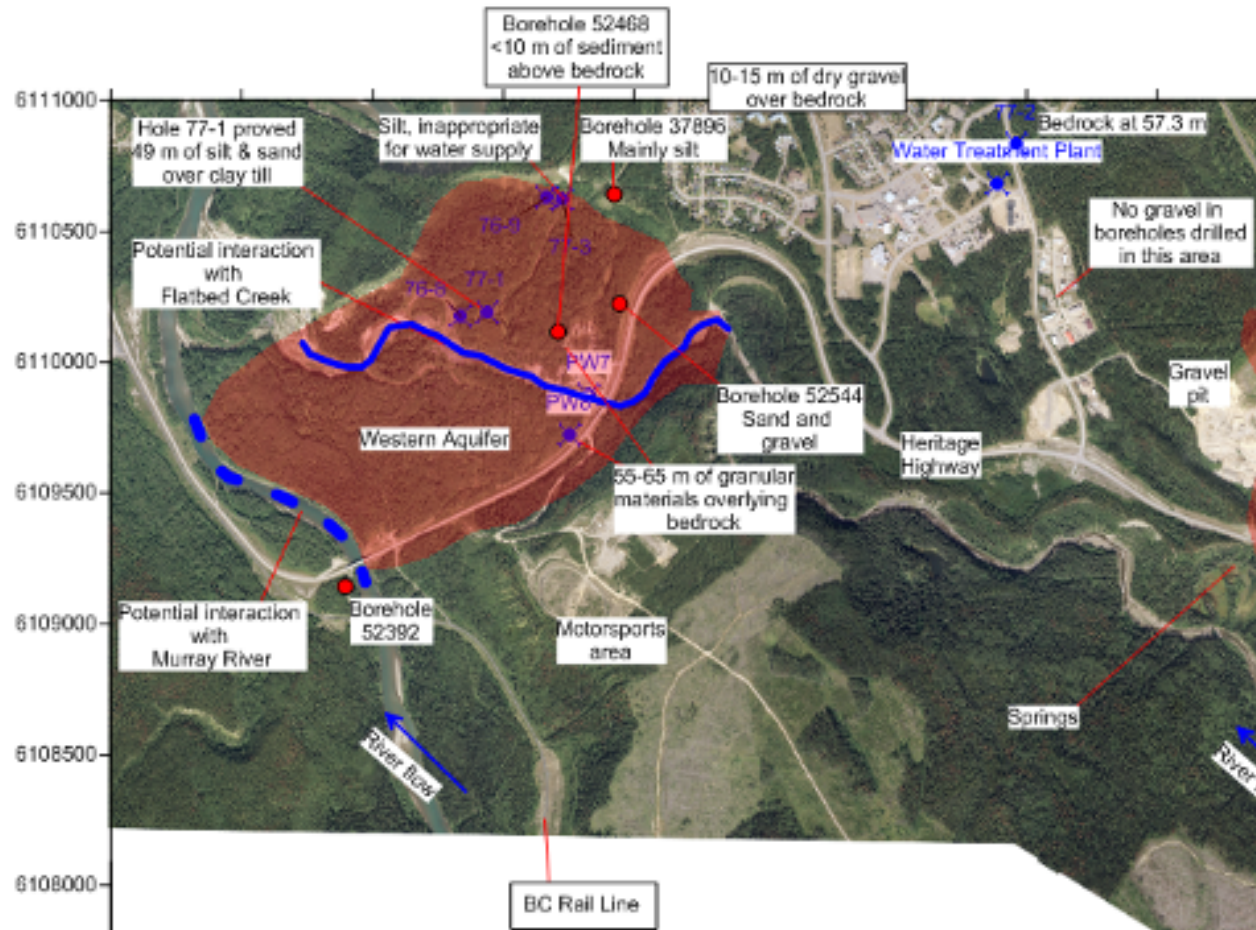
These factors - and more - invited subjective interpretation.

On The Grid: Aquifer Locations

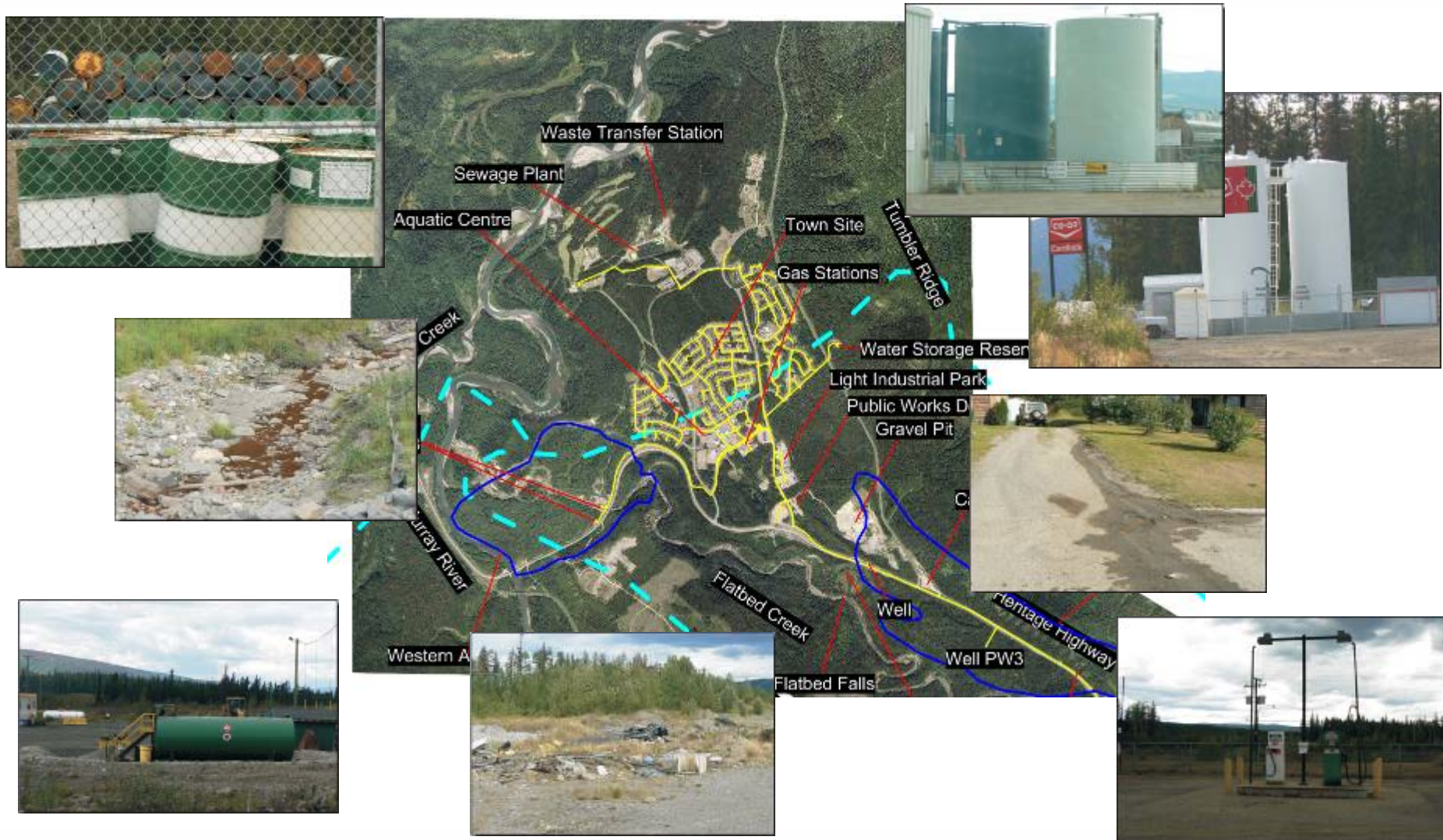


Outcome: Aquifer Knowledge Assessment

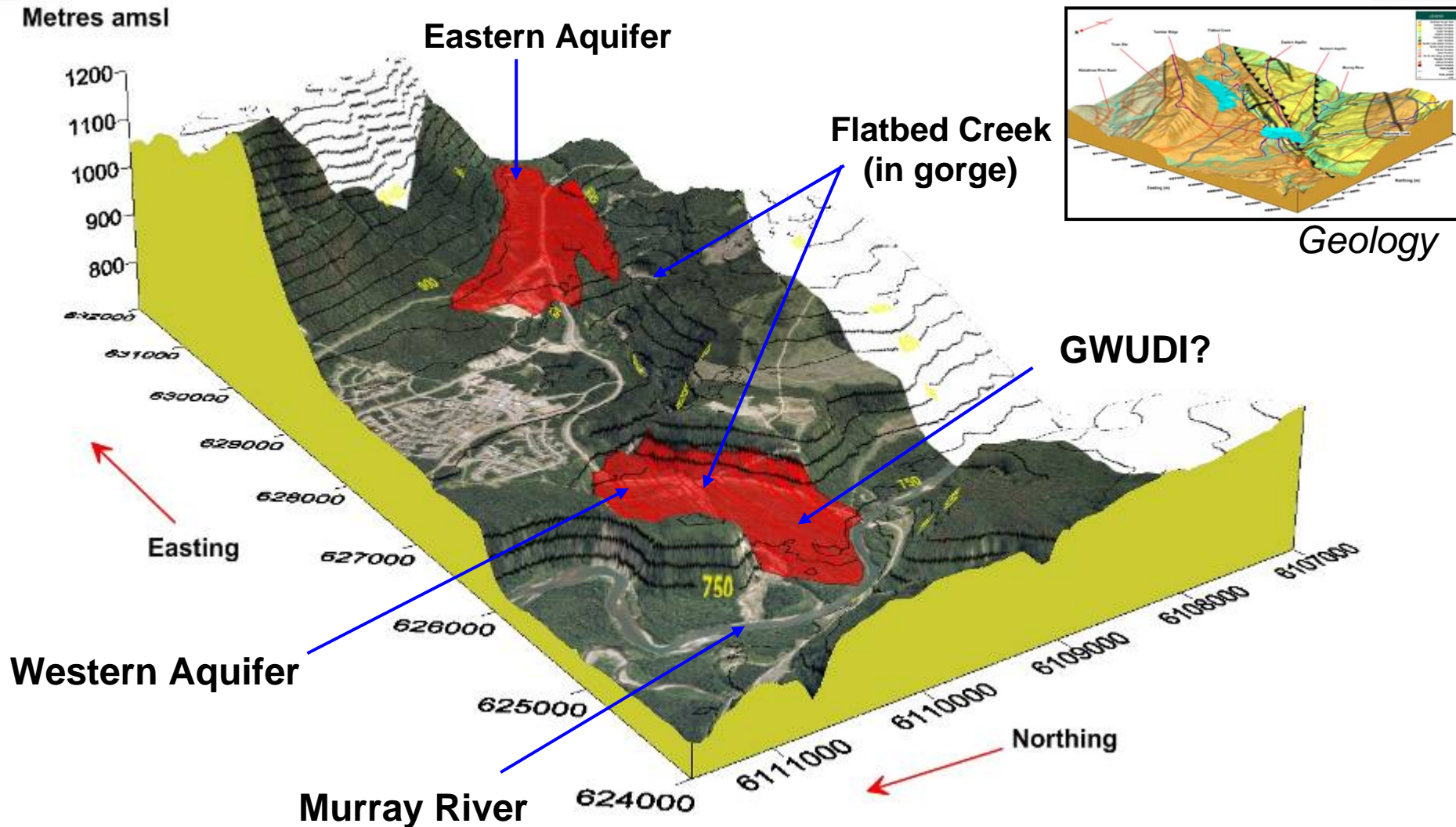
Weaknesses in geographic certainty identified. Questions raised for Stage 2.



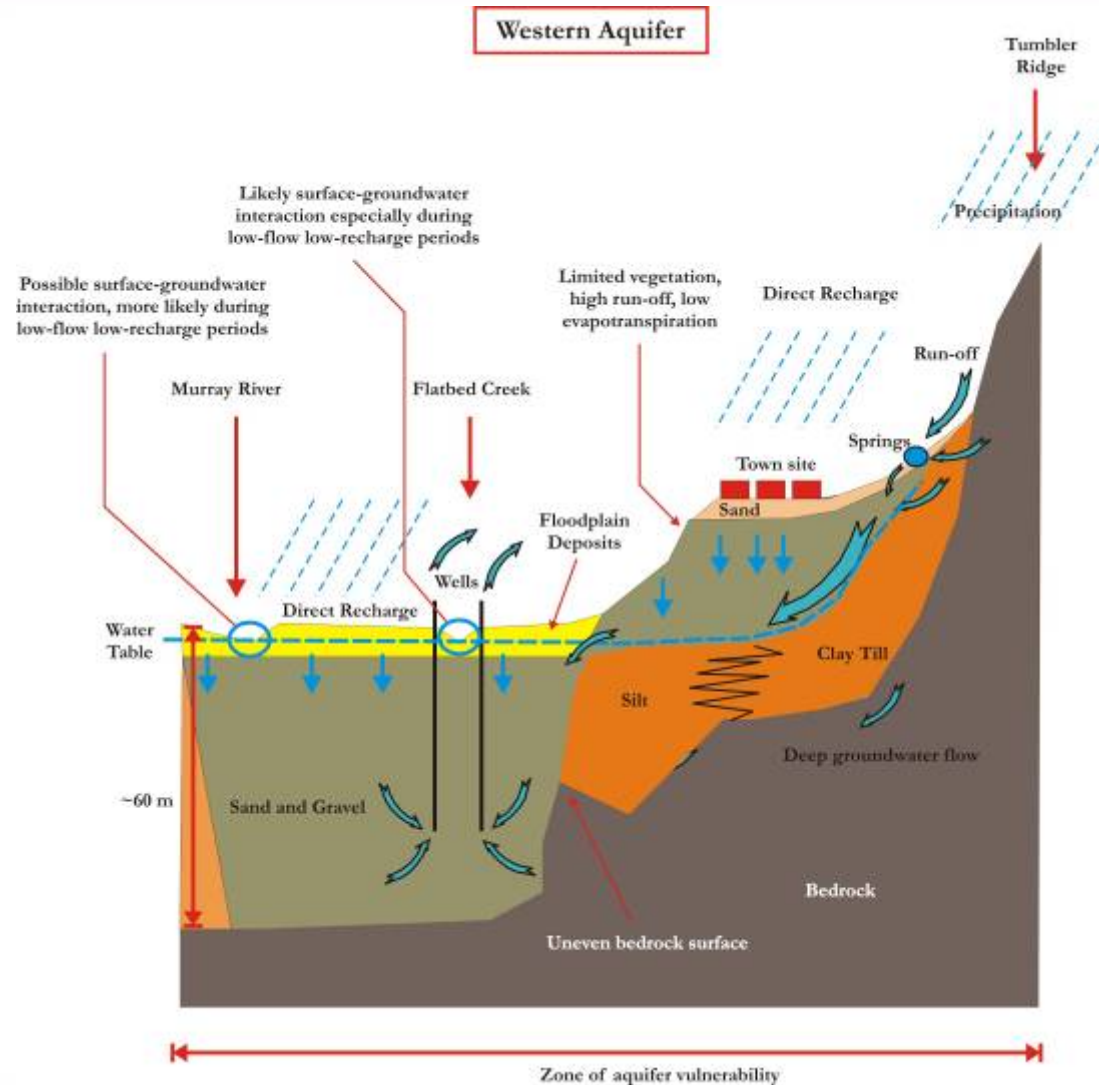
Outcome: Land Uses Identified



Outcome: Digital Spatial Model



Outcome: Updated Conceptual Model



Data gaps identified.

Aquifer limits either established or identified as poorly constrained.

Initial understanding of aquifers recorded.

All information spatially referenced.

Summary

Stage 1 is now complete

- Spatial understanding enhanced
- Knowledge gaps identified
- Information presented visually
- Model framework developed
- Scope of Stage 2 informed





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Thank You!